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THE tower of the great Norman Cathedral of Peterborough, in England, has recently shown such serious indications of decay as to make its demolition necessary. The tower is not very lofty, being but one hundred and fifty feet high above the pavement, but is one of the oldest portions of the building, and is naturally more exposed to deteriorating influences than the lower part. Most of our readers know something of the appearance of the Cathedral, with its splendid triple-gabled west front, and the round arches, with billet ornament, which characterize the interior. As a specimen of the English ecclesiastical architecture of the twelfth and early thirteenth centuries, such as it became in the hands of the great monastic orders, Peterborough is quite unrivalled; and although it is much to be regretted that anything of the original building should be lost, there is still enough left to exhibit the full grandeur of the style.

SOME criticisms have been made upon the plans for the new building of the Pension Bureau, to be erected on Judiciary Square in Washington, and the Commissioner of Pensions himself is said not to approve of them. Independent of the rather silly assertion made by some of the newspapers that the building will be "nothing but a pile of brick and mortar," just as if it needed to be anything more to combine all the excellences of the art of architecture, there is at least an appearance of reason in the opinion attributed to Mr. Dudley, that the arrangement of offices will be inconvenient. General Meigs's plan, which lies before us, contemplates, as our readers will remember, an immense hall, one hundred and sixteen by three hundred and sixteen feet, surrounded by a peristyle of seventy-six iron columns, supporting several stories of galleries, which give access to the various offices arranged around. Besides these small columns, the hall is crossed by two rows of larger ones, which carry a lantern light above. The motive of this arrangement was, as we understand, a desire on General Meigs's part to secure a spacious room which could be used for the various receptions and other assemblages which occur so often in Washington, and have been hitherto so wretchedly accommodated. Even the Capitol contains nothing but the small rotunda and a few scattered rooms to hold the concourse of people which fills it on state occasions, and the hall of the new Pension Office will be not only by far the best situated and most appropriate place in the city for such purposes, but will, by its vast dimensions and skilfully varied plan, form a most imposing and magnificent apartment. Whether it is worth while to sacrifice for this purpose any real convenience in the administration of the Pension Bureau is perhaps a doubtful question, but considering the value of the central hall for the purposes to which it will be appropriated, we connot see that any material advantage in the planning of the other rooms is neglected.

TWO deaths of persons of note in the architectural world are announced, one being that of Miss Rhoda Garrett, whose name is well known in this country. Miss Garrett was a woman of singular force and courage, as well as talent. Finding herself, on her arrival at the age of discretion, dependent upon her father, a poor country clergyman with a large family, she determined to do something to lighten his burden, and took the unusual step of entering an architect's office as a student, and afterwards as assistant. Having acquired the knowledge she needed, she went into business on her own account as a house decorator, taking into partnership her cousin, Miss Agnes Garrett. Notwithstanding the delicate health of one of the partners, the members of the new firm soon gained the respect and admiration of a large circle of clients and friends, among whom must be counted also the readers of the excellent little book on decoration prepared by the two cousins, and widely circulated on both sides of the Atlantic. The other death which requires notice is that of M. G. Bourgerel, who died recently at Nantes, France, at an advanced age. Although as departmental architect of Loire-Inférieure his professional employment was mainly confined to a poor and remote province, he had made for himself a European reputation by his beautiful sketches of ancient architecture, and his restorations of many of the more famous monuments. His book, the *Fragments d'Architecture Antique*, is well known in this country, and is perhaps the best work of the kind. This gained for him the high honor of an election as Corresponding Member of the Institute of France, and later, the gold medal of the Société Centrale was awarded to him in recognition of the superior beauty of his executed designs.

SOME remarks are made in a late number of the *Builder* in relation to the burning of the Alhambra Theatre, which should do much to comfort the American firemen who have felt aggrieved at the criticism of their methods indulged in by Captain Shaw. Speaking of the efforts of the fire-brigade, not to save the theatre, but to protect adjoining buildings, the account says that "this is evidently regarded as the best line of tactics to employ; and no wonder, considering the utter futility of the means at hand for doing anything to keep down the main conflagration." "To see the masses of flame within the theatre, and the jets of spray playing on them (for the column of water from the hose is broken into mere spray in its passage through the air) suggested a contrast almost ludicrous. One might as well think of putting out Pandemonium with a garden squirt." "Surely," the *Builder* continues, "it is time that some effort were made to place at our command a more effective weapon against fire than the fire-engine of the day furnishes." In the case of a large fire an immense amount of noise is made, the air filled with smoke, and the gutters with water, "but all the result is the pumping of a few showers of broken spray into the burning building, the effect of which upon the fire is absolutely *nil*." It is rather surprising to find an observant English journal repeating the very criticisms which are made by American experts upon the London system of fire extinction which Captain Shaw thinks so perfect, and the remedy which the *Builder* proposes, that of devising "means for throwing water in heavier and more solid streams," has long been successfully applied in this country.

CONSIDERABLE comment among builders and architects has been called out by the recent fires in ancient mansions in England, and one of the former—Mr. Thomas Potter,—has published in the *Builder* a very interesting paper in regard to them. In Mr. Potter's opinion many of the conflagrations in old houses are due to the presence of wood-bricks and bond-timbers in the masonry adjacent to flues. The latter, as is well known, were once much used, not only in England but in this country, while the former are often found to have been inserted in the front of chimney-breasts, perhaps disused at the time, for securing mirrors or wood finishings, and being afterwards forgotten, or plastered over, form a source of serious danger. In the case of timber near flues, the risk increases with the lapse of time, as the wood not only becomes more combustible by continued drying, but the mortar in the joints of the brickwork is slowly dissolved by the acid vapors in the smoke, and brushed away in the process of sweeping, leaving at last open passages for sparks to pass through. Another common cause of the burning of houses more than a hundred and fifty years old is found in the kindling of the wooden beams which were anciently used to support the front of chimney-breasts. As originally built, these beams were set about five feet from the floor, and were thus comparatively safe from over-heating, but many of the fireplaces in which they occur have been refitted for modern grates by building up the ancient opening with brickwork around the grates, leaving the wooden lintel undisturbed, to gather soot which may at any time take fire from a spark and kindle the timber.

A MEDICAL commission, which was appointed not long ago in Germany to study certain questions relating to the construction of school buildings, has made an interesting report, which must certainly be regarded as marking a step in advance in that branch of science. In the matter of ventilation we find that the members of the commission agree with all the other experts who have investigated the subject, in increasing the quantity of fresh air which is to be regarded as essential to health. It is but a very short time since a thousand feet of air per hour for each pupil was regarded as an extremely liberal theoretical allowance for healthy children, and in practice, in this country, at least, a room in which a hundred and fifty or two hundred feet per hour is actually supplied to each person is regarded as admirably ventilated. Now, however, those who have long submitted to be accused of foolish extravagance in insisting that this is an inadequate allowance may cite the authority of the German doctors, who set two thousand one hundred and twenty cubic feet per hour for each pupil as the *minimum* quantity of fresh air to be supplied. In the best arranged ventilating shafts, of metal, fitted with gas-flames, stoves or other artificial means for promoting the draught, the upward current will occasionally reach a velocity of a thousand feet per minute in cold weather, although the average is rarely more than five hundred feet, and generally much less; so that a room containing sixty pupils should have an outlet shaft of four square feet or more in sectional area to be even capable of such ventilation as is pronounced essential.

IN regard to lighting, the new commission totally denies and rejects the famous theory of unilateral illumination, following in this respect the French authorities, who began to call it in question a year or so ago. In the language of the report, it is *practically impossible*, even with lofty and narrow rooms, to obtain sufficient light by this method. In cases where openings can only be made in one wall, the report requires that the width of the piers between the windows shall not exceed three-fourths of that of the windows themselves, and that the width of the room shall not be more than five feet greater than the height of the windows, which would restrict it in such cases to about eighteen feet as a maximum. Lighting from two sides being then required under all ordinary circumstances, it is advised that the windows should be in the opposite walls, on the right and left of the pupils as seated. Light from the rear is admissible, but is not recommended, and windows facing the pupils are prohibited. Walls of neighboring buildings painted white and reflecting the sunshine into the school-room are very injurious, and the owners should be persuaded or obliged to paint them of a dark color. The inside face of the walls of the school-room itself is to be painted pale blue or bluish white, and the ceiling pure white. Artificial light should be used without hesitation on dark and short days; it is more dangerous to work by insufficient daylight than by gas-light. Argand burners are preferable as giving a steadier light, and ground-glass globes are objectionable on account of the large proportion of light which they absorb.

SOME details are given in the *Builder* of the discoveries made by Herr Humann at Pergamon, which prove to have been extremely interesting and valuable. So many portions of the ruined temple of Zeus have been recovered that the whole can be restored with certainty, and, by a happy inspiration, the special museum built at Berlin for the display of the remains has been so constructed as to reproduce the original temple, the marble fragments being inserted in their proper places. The arrangement of the interior, as positively determined by the explorers, differs from that of any other known temple. Apparently, Pergamon possessed a school of sculptors of which she was deservedly proud, and to afford the best possible facilities for observing the works with which the building was adorned, the interior of the cella, which seems to have been quite accessible to the public, was furnished with a sort of gallery, reached by a staircase behind the altar, by means of which the upper portions could be reached and closely examined. The decoration of the interior wall-surface of the cella consisted in a row of Ionic columns, or colonnettes, alternating with sculptured panels, and supporting a cornice, with an extremely rich sculptured frieze three hundred feet long, the fragments of which form the most important acquisition made by the expedition, and seem to be only second in value and interest to the unapproachable Elgin marbles.

THE subject represented on the frieze is the combat of the Titans and the Gods. The giants are shown under a variety of monstrous forms, some as sea-horses, some as human-headed serpents, and some as winged men, many of them with countenances distorted with rage and pain, and contrasting with the calm serenity which the Greeks always impressed upon their representations of the immortal deities. Among the more remarkable figures is one of a young Titan falling in agony at the foot of Athena, and encircled by the coils of a serpent, which is said to be absolutely identical in pose, gesture, and even in minute details, with one of the younger figures in the group of the Laocoön. The only difference is in the movement of the right arm, which was missing in the Laocoön group when discovered, and was restored by Montorsoli as we now see it, stretched upward, with the hand open and the fingers stretched out: in the Pergamon bas-relief, this arm is bent and drawn up close to the body, the hand almost touching the head. We know that the masterpieces of Grecian art were copied and re-copied by the sculptors of later days, and it is by no means improbable that the artist of the Laocoön, which is a work of comparatively recent date, may have at least derived a part of his inspiration from the ancient temple sculpture. The general style of the work is said to resemble that of the so-called Victory of Samothrace, now in the Louvre, and the well-known figure leading a bull, from the temple of the Wingless Victory at Athens. A single fragment, that of the head of a young girl, found near the temple, is said to recall the type of the Venus of Milo, which, as our readers will remember, so good an authority as Mr. Stillman conjectures to be no other than the veritable statue of the Victory herself, made wingless in order that she might never be able to desert the Athenians.

A NEW building now in process of construction in New York has a cellar which will alone cost, below the first-floor beams, about four hundred and thirty thousand dollars. Before commencing the building, the rock upon the lot was in some places twenty-five feet higher than the grade of the neighboring streets, and all this mass had to be cleared away before the excavation proper could begin. The average depth of the cellar below the curbstone grade is eleven feet, so that in many places thirty-six feet of rock was removed. The building itself covers eighty-one thousand square feet of land, and the excavation was carried out under the sidewalks all around to the curb, a distance of about fifteen feet. The cost of the excavation alone is estimated at one hundred and thirteen thousand dollars, and the foundation walls, concrete, drainage-works, and so on will be about three times as much more.

OBSERVATIONS made in South Australia seem to indicate that the influence of forests in increasing the total amount of rainfall on a large given area may not be so decided as has sometimes been supposed, but there is no doubt that the character of the deposition of water in wooded regions is much more gentle, and therefore fertilizing, than in denuded countries, where long droughts alternate with short but violent rains. In a limited territory the good effect of tree-planting is much more obvious, as the wooded area attracts to itself in frequent showers the moisture which would otherwise fall only in excessive rains, or might pass altogether beyond, to be deposited upon some mountain ridge affording the conditions necessary for condensation. In Egypt, for instance, which has from time immemorial been ranked as a rainless region, showers are now frequent, and the measured average rainfall on the Delta has increased from six to forty inches. This great change, which has brought the Egyptian climate from that of a desert to a degree of moisture equal to the average of England, can be accounted for only as the result of the planting of some twenty million trees by the three last viceroys of the country. In the United States, a considerable amount of prairie land in Southern Indiana and Illinois has, thanks to the improved watchfulness and care of its civilized owners, been successfully converted into forest, and the natural adaptation of the soil for this purpose is shown by the fact that in a single square mile of wood seventy-five species of trees, or almost as many as are found throughout the whole continent of Europe, were observed to be growing. These seventy-five species included nearly all the varieties of valuable timber trees known, and specimens of fifty-one of them were found which were estimated to be at least one hundred feet in height.

THE EXPLORATIONS AT ASSOS.[1]—III.

WE cannot give much space to descriptions of the other points of interest touched on in the report. There are many such points, but the greater part of this, the first report, is given up to the temple, as most of the first year's work has been; leaving the other buildings and remains of Assos to be described in later reports. The exploration has not been rich in the discovery of portable objects which can be carried home to adorn museums, but it has been none the less valuable for the uses of archæological study. Among the buildings of which are promised a fuller account is a stoa, an open portico nearly four hundred feet long, notched in under the brow of the acropolis, below the temple, and opening on a terrace which looked southward over the harbor and across the open strait to the island of Lesbos. About it are numbers of reservoirs and cisterns, to which the rather arid climate of Assos gave special value, and varied groups of ruined buildings, both ancient and mediæval. West of the stoa are the broad ruins, not yet fully examined, of what the explorers have tentatively called a gymnasium. Within it are to be seen the traces of a large building assumed to be a basilica, with an apse turned eastward, and showing interesting fragments of a pavement in colored mosaic with a rich border. Under the stoa, so placed that the lounger on the terrace could look down the ranges of sloping seats into the orchestra, is the theatre described by Hunt and Prokesch von Osten, its stage and orchestra apparently still visible, and the lower semicircles of seats, with the podium about the orchestra, displayed by a trial excavation. Scattered over the slopes are ruins of a variety of structures, porticos, possible temples, a domed Byzantine church, now used as a mosque (ingeniously described by an early French examiner as "a monument belonging to the great ages of Greece"), an agora, the remains of another Byzantine church, and at the bottom the little artificial harbor where the huge blocks of the ancient mole can still be seen under water, enclosing the inferior wall which the Turks have built within it. It would seem from the map which accompanies the report that the southern slope had been occupied by the public buildings of Assos, while the town of residences lay on the north of the acropolis, where the Turkish village of Behram makes it impossible to see what is beneath the surface.

Round the whole run the ancient walls, still in wonderful preservation, Mr. Clarke says, in spite of Turkish depredations since Texier's time, and easy to follow throughout almost the whole of their two miles of circuit. It is one of the purposes of the expedition to make a thorough examination of these walls, which are said to rival the famous walls of Syracuse as examples of ancient fortification. They are, according to Texier's report and Mr. Clarke's, built in squared coursed blocks of the reddish trachyte of the country, laid close, without mortar or cramps, into two walls which enclose an open gallery between them, as at Tyryns and elsewhere, making in all a structure some ten feet thick. They have occasional loop-holes, and large towers at the gates. The openings are fitted with jambs carrying double lintels, over which are relieving arches both round and pointed, yet not laid in voussoirs, but simply cut out from the horizontal courses, in the primitive Greek fashion. In some places, as Mr. Clarke notes, an older Pelasgian or Cyclopean wall is built over with the later coursed work.

But the most interesting architecture, next to the temple, described in this report, is that of the Street of Tombs, or rather necropolis, since it consists of more than a single street. It lies outside the walls, according to the Greek and Roman habit, on the western slope of the hill, and before the chief entrance of the city. Here is the only level part of the main road which leads up to the acropolis. Beside and above it, laid out in terraces which rise till they reach the bordering wall on the height, is the cemetery. Here were found a great number of tombs and sarcophagi. Most of them had been attacked and rifled with an energetic zeal which had broken the heavy stone covers of the sarcophagi, or dashed in their sides, where they were hollow, or spent itself in bruises where they were solid; but a few still contained vases and other small objects of funeral service, and even human bones. Mr. Bacon's sketch of a restored section of these terraces is an enticing picture. Arranged along the edges of the terraces are tombs in great variety of form, smaller sarcophagi of a single block, larger ones built up, and some richly carved, vaulted receiving-tombs with niches and benches, one of which is shown in detail in the report. The large carved sarcophagus of which the report gives a view in its present condition (p. 127) and a restoration (Plate 34) is one of the most gracefully-designed tombs that have yet been discovered. Since the publication of the report the ground about it has been dug away, and it now appears that the sarcophagus with its surrounding stone bench was raised on a broad platform above the terrace, with a high cippus or pedestal in the form of an altar projecting from the face of it. The whole group, according to the drawings of it sent home, made an architectural composition of extreme dignity and elegance. The cemetery was laid out with an eye to its picturesque fitness for a public promenade, and two exedras, one semicircular in plan, and the other making three sides of a rectangle, were found at the heads of two flights of steps leading up to one of the terraces.

Another interesting monument—and of especial importance, because no other like it is known to exist—is the ruined bridge over the Satnioeis a mile or so north of the principal gate. The aversion of the classical Greeks to the arch—or their preference for the lintel—seems to have extended even to their bridges, which being mostly built of wood have naturally perished. But here are the remains of a stone bridge which Mr. Clarke unhesitatingly, and no doubt rightly, assigns to the classical period. The Satnioeis, like most rivers in dry countries, is a very much broader stream in winter than in summer, and across the winter bed of the river, which appears to have been carefully paved, the bridge was carried on seventeen stone piers, while the summer bed, where it makes a span of about forty-five feet, is flanked on one side by a heavier pier and on the other by a solid abutment. The piers are rhombic in plan, about twelve feet long and a yard wide, their longer diagonal being of course with the current. They are admirably constructed in courses joggled on each other horizontally, so that neither current nor ice-flow could slide one course upon another. The bridge, following the road, was somewhat skewed, and the piers, with their longer axes parallel to the current, were set *en echelon*, the roadway therefore crossing them obliquely. The piers were about their own length apart from centre to centre; the roadway, ten feet broad, was a platform of four stone beams two feet and a half wide and fourteen inches deep, with an average bearing of nearly twelve feet. Holes are visible for the swallow-tailed wooden dowels which held them together in the customary manner of Greek stone-cutting, and show that each beam was dowelled to those beside it, the outside ones to those they abutted against end to end, and all to the piers on which they rested. One can only guess that the wide span over the permanent stream was crossed by a timber bridge. Somewhat lower down the river are the arches of a Roman bridge, from which the stream has wandered away till it is out of sight.

We must speak briefly of the merits of the report as a document. The Archæological Institute is fortunate in having the aid of Mr. Clarke's energy and trained intelligence, and of Mr. Bacon's artistic capability. We have never seen better work in its kind than the drawings which illustrate the report. They have a convincing air of truthfulness, as well as a very attractive simplicity of treatment and artistic handling. Mr. Clarke's account of the work is vigorous and graphic. The whole story of the explorations has the mark of intelligent management, conscientious work, and acute and precise observation. The result has been obtained at a very small cost, less than nine thousand dollars thus far for the whole expedition, which, compared with the outlay, for instance, of eighty thousand dollars by the British Museum for the excavations at Ephesus, seems singularly little. We are told that the second summer's work has exhausted the purse of the Institute; while there is still some work of importance to be done, especially the thorough examination of the walls and fortifications of Assos, for which this is probably the only opportunity; for the Turks, needlessly exasperated perhaps, but not unnaturally, at the way in which their territory elsewhere is being despoiled of relics which they themselves have not learned to value, declare that they will grant no more permits for excavation to any one. Mr. Clarke estimates that the rest of the work can be done for another twenty-five hundred dollars. It is to be earnestly hoped that the friends of research will help the Institute, which has given all the money it could to the work, to raise what is necessary to fitly complete it.[2]

The getting-up of this report is excellent. The drawings are more than fairly-well reproduced, though the plates of sculptures might do more justice to the originals if the reproductions had been somewhat smaller in scale. The simple, convenient and rather elegant form in which this paper is printed leads one to hope that when the "monumental volume" is issued, which Mr. Clarke promises as the final outcome of the expedition, the same taste and judgment will strike the right mean between the useful and the magnificent. The monumental volumes which gratify the *amour propre* of their producers and catch the applause of dilittanti, bestowing indiscriminate splendor of execution alike on bare plans or delicate ornament, are apt to be the despair of the serious student and the professional man,—being too big to handle and too costly to buy.

We heartily commend the report to those of our readers who find it within reach. To persons who do not otherwise follow the progress of archæological research, it may give a good understanding of how such work is done, and of its character,—perhaps a new interest in the subject, if not quite the enthusiasm of a discoverer.

It is natural, indeed, that the explorer's parental instinct should invest his foundlings with special charms, and perhaps ordinary readers will hardly keep pace with Mr. Clarke's exegesis of the

[1] Papers of the Archæological Institute of America, Classical Series. — I. Report on the Investigations at Assos, 1881. By Joseph Thacher Clarke. With an Appendix containing Inscriptions from Assos and Lesbos, and papers by W. C. Lawton and J. S. Diller. Printed at the cost of the Harvard Art Club and the Harvard Philological Society. Boston: A. Williams & Co. London: N. Trübner & Co., 1882.

[2] It is pleasant to see it publicly announced, since the above was written, that the necessary money has been raised, and that the exploration will go on.

sculpture figured in Plate 17, a lion attacking a boar. "The legs and tail of the boar," says Mr. Clarke, "are characterized with great truth. Though seized by the lion, the animal has not lifted his head from rooting, the attack in the rear not seeming to cause him much disturbance. The hind legs are set to withstand the burrowing push of the snout; the tail hangs limply on the broak flank as if in indication of hoggish enjoyment." "The sculptor," he adds, "has displayed a certain sense of humor which makes up for the ungraceful carving,"— and some sense of humor is a prophylactic which is not without its value, either in art or criticism.

The reader will bear with the writer's repugnance to the usual English terminology of his profession, and almost hydrophobic shunning of terms of Latin origin,— with the use of *pteroma* for peristyle, of *crepidoma* for stereobate, *epistyle* for architrave, — and can forgive the shock of reading *trunnels* for guttæ. But if he is sensitive in the subject of good manners he will be more seriously disturbed at Mr. Clarke's treatment of Texier. We have no doubt Mr. Clarke is right in charging that Texier's examination was superficial, his conclusions hasty, and his report full of errors; that like most restorers, and perhaps with less caution than most, he filled up the gaps in his information with guesses. It is perhaps not going beyond bounds to say, as this report quotes, that he had "*le génie de l'inexactitude.*" The greatest paradox in Texier's restoration, the sculptured architrave, Mr. Clark has confirmed, against his own expectation. But he accuses him in so many words, of "unparalleled effrontery" for putting in, "scaled to the millimetre," a bed-mould under the corona. This bed-mould, we believe, is nowhere found in Greek Doric, and for this reason it is not necessary to assume nor easy to believe that Texier put it into his restoration without having seen something which persuaded him that it did exist. Again says Mr. Clarke, Texier's assertion "that the thickness of the reliefs was uniformly equal to one-half the lower diameter of the peripteral shafts must be regarded as deliberately false." He could hardly have offered a grosser affront. Yet if the reader will take the trouble to measure Mr. Clarke's restored section of the entablature he will see that the upper bed of the sculptured block—not the soffit, which is rebated to receive the middle lintel — has nearly (Texier does not say "uniformly," and the lower diameters are by Mr. Clarke's account irregular) the width of the lower diameter, sufficiently so to justify the general remark which provokes Mr. Clarke, and the argument drawn from it, that the blocks really were part of the architrave. It is our impression that M. Texier has already gone where this attack in the rear will not cause him much disturbance; but it is a pity that any one whose intelligence and acquirement has a real claim on our respect should pursue him with the language of contemporary politics. It is a pity to import into the first prominent publication of the Institute, which is in most respects a model report, the personal rancor that gives unsavory notoriety to German savants.

AMERICAN ARCHITECTURE IN ITS CONSTRUCTIVE AND SANITARY ASPECTS.[1]

AT the ordinary meeting of the Royal Institute of British Architects, held on Monday evening, December 18, Mr. Ewan Christian, Vice-President, in the chair, Mr. A. J. Gale, the holder of the Godwin Bursary for 1882, (the first year of its award) described what he had seen during his tour in the United States. He observed that at the invitation of the Council he ventured to bring before the Institute some account of his tour as holder of the Godwin Bursary for 1882, the first year of its existence, although he was obliged to admit his inability to do justice to the subject on account of its extent and varied nature. The tour covered a great deal of ground, and that he had been enabled to see so much as he had seen was due to the great kindness of many American architects. The tour occupied exactly three months, of which ten weeks were spent in America — five weeks in New York, and the remainder of the time at Philadelphia, Baltimore, Washington, Chicago, Detroit and other cities. In New York at the time of his visit there were many vast building schemes in hand. Prominent among the matters to which he turned his attention was the work being done by the New York City Board of Health with the view of improving the tenement-houses with regard to drainage and other sanitary arrangements. He had, however, dealt somewhat fully with these matters in the report which he had previously presented to the Council. Vast buildings let off as offices formed one of the sights of New York. Such blocks were continually being erected, and the most recent one generally managed to outshine its predecessors in some particular or other. Foremost amongst the works of this kind at the time of his visit was that known as the Mills Building (from the name of its owner, Mr. D. O. Mills), having frontages to Wall Street, Broad Street, and Exchange Place. This building, of which Mr. George B. Post is architect, was nine stories high above the ground level, with a cellar or basement story below. The basement, ground, first and second floors contained strong-rooms for the deposit of books, securities and other valuables. All the floors were intended for suites of offices, divisible by means of partitions into holdings of any required size. The lighting throughout he considered good and sufficient, though, judging from the plans, some of the rooms only had "borrowed light." The large entrance-hall was two stories in height, and it contained elevators or lifts constantly conveying passengers up and down, although the building was only partially completed and opened at the time of his visit. The entrance-hall, which contained a well-hole for lighting the basement, had a glass roof. The offices derived their light partly from the street frontages and partly from the lighting space or area over the roof of the entrance-hall. The height of the cellar or basement story was 9 feet, that of the ground floor 13 feet 8 inches, that of the first floor 17 feet 8 inches; the height of the stories gradually diminishing from the second to the ninth story, which was 10 feet in height. The walls were of brick, with red-brick facings and stone and terra-cotta dressings. The general design consisted of a simple combination of vertical and horizontal lines, very effective and suitable for the purpose, the treatment of the detail generally being classic. The roof was flat, constructed of rolled-iron joists filled in with terra-cotta bricks in the form of voussoirs, and covered with cement. Roofs of this construction had been used upon almost all recent buildings of large size. The main stairs were entirely of cast-iron, with the exception of the treads, which were of slate; iron-work taking the place of wood in the construction of newels, strings, risers, balusters, etc. The internal partitions between the offices were built of hollow terra-cotta bricks, corrugated externally to receive the plastering. To preserve the handsome hard-wood dados from decay through damp from the washing of the floors, marble plinths were provided. He understood that the drawings for this building were prepared, and the building completed ready for occupation, within twelve months from the time that the architects received their instructions, — an illustration of the great rapidity of performance which was characteristic of American building operations. The heating of the building was effected by steam, on the direct radiation system, and the coils of steam-pipes standing in the rooms formed by no means inelegant features. The system of steam-heating by direct radiation seemed to find more favor amongst American architects than steam-heating by indirect radiation, or heating by hot water or hot air. With regard to the apartment-houses of New York, Mr. Gale said he had entered somewhat fully into details in the report which he had presented to the Council. Many of these blocks of buildings in flats were eight or nine stories high, and those for the middle classes were constructed in the most elaborate manner and provided with all the conveniences that modern construction could command. The construction of the tenement-houses or flats for the lower classes was under the supervision of the New York City Board of Health, who were empowered, under an act passed in 1867, and amended in 1879 and 1880, to regulate the construction and sanitary arrangements of these dwellings, and the results which had been obtained under this administration were very satisfactory. Plans of all proposed tenement-houses had to be submitted for the approval of the Board, and careful attention to the observance of the Board's requirements with regard to construction and materials was enforced by a staff of inspectors. The higher class of houses in flats, known as apartment-houses, were subject to corresponding restrictions. These buildings were provided with handsome entrance-halls, and elevators continually running up and down. The best arrangement of plan for these buildings was obtained by grouping round a compact central hall, not too large — in fact hardly more than a large lobby — four or five dwellings or suites of apartments. The servants' rooms were kept quite apart. An entrance-court, formed in the basement and easily entered by tradesmen's carts, gave access to the servants' elevators. This court, which was well lighted and ventilated, was for the most part covered with a substantial roof, the top of which formed the court-yard or carriage-entrance for the residents. The floors were mostly of fire-proof construction, consisting of iron joists filled in between with hollow arching-blocks, the iron-work being protected above and below, and joists being laid on the top surface of these fire-proof divisions. Most of these buildings were constructed externally of brick, with stone dressings. The roofs were flat and of fire-proof construction, and the heating was effected by steam on the direct-radiation system. Fireplaces were, however, provided as well. The wood-finishings were generally good. Some of these blocks of apartment-houses were built by associations of intending occupiers, who were thus able to provide themselves with exactly what they wanted, and at the same time were able to choose their neighbors. The plumbing and house-drainage

[1] From the *Builder*.

arrangements of New York were also under the control of the City Board of Health. Under their Plumbing Law, dating from 1881, all plumbers had to register their names and addresses, and had to submit sketches and details of all works proposed to be executed by them. The chief point in which the regulations differed from the most advanced English views at the present time was in regard to the material to be used for soil-pipes, which in New York were required to be of iron, which must be properly jointed and coated inside and out with coal-tar pitch applied hot, except where enamelled surfaces existed. The other rules insisted upon by the Board did not differ much from those observed in the best English practice, but there was a thoroughness about the inspection, and an amount of attendance to minor details, which were far in advance of the supervision of an average English local Board. Every precaution in the way of ventilation and the prevention of siphonage was rigidly insisted upon. The Durham House-Drainage Company, of Chicago, contend that as it is worth while to convey coal-gas in wrought-iron mains with screw-joints, in order to prevent leakage, so it is worth while to prevent the escape of sewer-gas by the same means. This company uses wrought-iron pipes with screw-joints for soil-pipes, which are strong enough of themselves to carry the entire weight of the closet-apparatus, without any support from the building. By this means, it is urged, all danger of leakages owing to settlements is completely avoided. For the horizontal or drain pipes this company uses cast-iron, socket-jointed pipes, the joints being made with lead. These iron drain-pipes could be, and often were, suspended from the under-side of the ground-floor of a building, and were provided with movable caps, to allow of inspection or cleansing if necessary. This system of house sanitation had been adopted in a town built by Mr. Pullman, of sleeping-car fame, for his work-people. In Chicago and Boston, as well as in New York, great attention had been paid of late years to the ventilation of public buildings. The Fifth-Avenue Presbyterian Church, New York, better known as Dr. John Hall's Church, was one of the most successfully ventilated buildings in the world. It was erected from designs by Mr. Carl Pfeiffer, and was pronounced by Captain Douglas Galton to be the best ventilated church he had seen.[1] The Madison-Square Theatre (of which Messrs. Kimball & Wisedell were the architects) was also very effectually ventilated on the same principles. The most important work now in progress in Philadelphia was the immense block of public buildings to contain the various municipal offices. The buildings occupy a nearly square site, the two frontages from north to south measuring 486 feet 6 inches, and the two frontages from east to west measuring 470 feet, the area of the site being 4½ acres in extent. The offices are grouped round a huge quadrangle. The large tower in the north front was 90 feet square at the base, and it was proposed to carry it up to a total height of 535 feet, it being surmounted by a statue of William Penn, 36 feet in height. The following were some of the other dimensions: height above pavement-line to centre of clock-face in tower, 361 feet; diameter of clock-face, 20 feet; height of upper balcony, 296 feet; total number of rooms, 520; total amount of floor area, 14½ acres; height of each centre pavilion, 210 feet 10½ inches; height of corner towers, 161 feet; height of basement story, 18 feet 3½ inches; height of principal story, 33 feet 6 inches; height of second story, 25 feet 7 inches; height of third story, centre pavilions, 26 feet 6 inches; ditto, wings, 24 feet 3 inches; ditto curtains, 20 feet 5 inches; height of attic of centre pavilion, 15 feet; height of attic of corner towers, 13 feet 6 inches; height of figures on centre dormers, 17 feet 6 inches; height of figures on corner dormers, 12 feet 10 inches. The substructure was of fine white granite, the superstructure being of white marble. The tower was to be built of squared, dimension stones, weighing from two to five tons each. It had not been attempted to make the building fire-proof in the sense of protecting all the constructional ironwork. The building was being erected from the designs of Mr. John McArthur, architect, under whose superintendence the sculpture and carved work in general were executed after models prepared on the spot. Mr. McArthur's designs were selected in competition in September, 1869, and the building was commenced early in the following year. The total amount spent upon the building up to 1879 was $5,000,000, and the estimated total outlay was $10,000,000.[2] The new Post-Office at Philadelphia was next described in some detail by Mr. Gale. It is being erected under the superintendence of Mr. James G. Hill, Supervising Architect to the Government. The drawings for this and similar buildings were made in Washington, where architectural matters formed a branch of the Treasury Department. Mr. Hill's last annual report showed many court-houses, post-offices, custom-houses, and the like, in course of erection, each under the care of a competent official architect. The essayist then proceeded to say a few words as to the Johns Hopkins Hospital, Baltimore, which he said was one of the most interesting buildings of its kind in the world. This building was the result of a study and examination of all the chief hospitals in Europe, by Dr. Billings, of the United States National Board of Health, who was selected for that purpose under the will of the founder, the late Mr. Johns Hopkins. The architects were Messrs. Cabot & Chandler, of Boston, and Mr. Niernsée, of Baltimore, the last-named gentleman being the consulting architect. Mr. Gale, in conclusion, noticed the methods of constructing iron-fronted buildings, and described the precautions which were being taken in Chicago, Boston, and other large cities against the recurrence of such disastrous fires as those cities had experienced of late years. Several methods of fire-proof construction were described, including the one which is being applied by a company under the management of Mr. Wight, formerly an architect.

The Chairman, in inviting discussion, said he thought Mr. Gale had shown that he was a very proper holder of the Godwin Bursary, and he had given them a large mass of information which it was not easy to digest all at once. When Mr. Gale was describing the immense public buildings of Philadelphia, and the enormous scale upon which everything was being carried out in them, he (the Chairman) felt very much like one of the inhabitants of Lilliput. He was reminded of what Professor Cockerell was very fond of dwelling upon, — the description of the stones which were used in the building of Solomon's Temple,—"great stones," "large stones," "costly stones." The new public buildings in Philadelphia resembled Solomon's Temple in another particular, viz., in the fact that every stone and every part was prepared ready for fixing before coming on the site. There was a great deal to be learned from the doings of American architects, as detailed by Mr. Gale, and from personal observation during a visit to America he (the Chairman) could fully confirm a great deal that had been said by the essayist.

Mr. John Slater said it seemed to him that America was the country, *par excellence*, where suggestions were to be picked up by architects. To put the matter colloquially, it was the great place for "tips," and there could be no better place for an architect to visit than the States, after studying on the Continent of Europe the artistic and archæological sides of his profession. The Americans were, in fact, so ingenious that their ingenuity was catching, and it appeared to be impossible for any one to visit the States without deriving much instruction. As a proof of this assertion, he mentioned that some time ago he was superintending some work where the builder's foreman was a man who had visited Chicago, and spent some time there in working at his trade,—that of a carpenter and joiner. A very excellent foreman he was. Like Ulysses, he was rich in resource, and altogether he was a very different sort of man to the average builder's foreman. It appeared to him (the speaker) that builders and builders' foremen were the most conservative men that it was possible to come across. They seemed, almost without exception, to think that what was good enough for their fathers was good enough for them. As a rule, they had very little idea of scientific principles of building construction. The consequence of this state of things was that if an architect wanted to do anything out of the ordinary way it was very difficult to get it done properly. It resulted from this, again, that architects were, in a measure, in danger of confining their work too much in one groove. For these reasons he looked with great delight upon the institution of the Bursary which Mr. Godwin had been good enough to endow, for by its means they would be enabled to get a practical knowledge of a great many of the constructive and other details of the architecture of other nations, and should be taught the wholesome lesson that everything English was not necessarily the best. It was only with regard to what might be called the constructional part of an architect's profession that he made these remarks, for he thought that the attempts which had been made of late years to evolve what had been called a "Victorian" style had not been very promising. The chief points observable in American architectural practice were the means that were taken for economizing labor and for utilizing waste products. Of course, those results were largely due to the fact that in a new country, where labor was scarce and therefore costly, it was necessary to devise labor-saving machines. To take the use of the telephone as an instance, he believed that in America there was hardly a town of 6,000 or 7,000 inhabitants that was without its telephone-exchange, and the amount of time and labor saved by that one appliance alone was prodigious. With regard also to electric-lighting, the practical adaptation of that means of illumination was very much more largely developed in America than in this country. Then again with regard to the utilization of waste products, great strides were being made in the United States. He was reading only last week in an American scientific paper how a large manufacturing firm had hit upon a means of condensing the smoke from their furnaces, with the result that from a million cubic feet of smoke they had been able to extract 4,000 lbs. of acetate of lead, 70 gallons of alcohol, and some other useful products, the gain achieved representing not only the value of the products so saved, but including, of course, the preservation of a purer atmosphere. These were only a few of the ways in which the Americans were turning their ingenuity to account. He should have been very glad if, among the other subjects which Mr. Gale had been able to study, some mention had been made of the educational buildings of the States, to which great attention had been paid. A few months ago he (Mr. Slater) received from the Educational Bureau at Washington a treatise on rural school architecture, showing the best means of planning, building, ventilating and warming such schools, on which, as a rule, only a very limited outlay was possible. In the treatise the scientific laws of ventilation were precisely laid down and illustrated, and altogether the little book was one of the most useful of its kind that could be conceived. If in this country our own Education Department would issue such manuals great good would be done, if only in preventing School Boards from laying down such absurd conditions as were sometimes imposed by them upon architects

[1] See *Builder*, vol. xxxiv (1876), pp. 193, 195, for view and plans of this church, together with description of warming and ventilating arrangements.

[2] A double-page view of this building and some additional particulars will be found in the *Builder*, volume for 1876, pp. 712, 715.

whom they invited to send in competitive designs for schools. The treatise to which he referred was issued in 1880, and it was stated in the preface that it was hoped to issue further publications dealing with the construction of high-schools, academies, and colleges, — in short, with buildings for what we called secondary education. He begged to move a vote of thanks to Mr. Gale for his paper, and he thought that the Institute might be congratulated upon the first results of the Godwin Bursary.

Mr. H. McLachlan said that as an unsuccessful competitor for the Bursary last year, he had much pleasure in seconding the vote of thanks to Mr. Gale, who had evidently made good use of his time and opportunities. It appeared that in America there was great variety of materials; for, besides stone, brick and wood, iron was also used for the fronts of buildings. It would be interesting to know a little more as to the manner in which buildings of iron and wood were protected against injury resulting from the extreme climatic changes experienced in North America. How was it possible to warm the buildings which were constructed on what had been spoken of as the "iron shell" method? If he understood that mode of construction, the front of the buildings consisted for a large part of its surface of a mere skin of iron, which would afford little or no protection against extreme external cold or heat. It was well known that the old abbeys of Britain, where the walls were very thick, were warmer in winter and cooler in summer than buildings whose walls were of the thickness now commonly used. With regard to the methods of fire-proof construction which had been described, it appeared to him that there was danger in covering up the structural iron-work in the manner described, inasmuch as iron was, as everybody knew, liable to decay by rust, and it was, therefore, advisable to be able to get to the iron-work to inspect it occasionally, so as to judge of its condition. But by the means of covering up which had been described such inspection would be impossible. Mr. Gale was to be congratulated on having got together so many drawings explanatory of what was being done in America.

Mr. W. Woodward expressed the hope that, as the paper was one of great interest and practical value, the council would publish an adequate number of the illustrations to accompany it in the "Transactions."

Mr. Andrew T. Taylor said that as he had just returned from a visit to the United States and Canada he should have much pleasure in supporting the vote of thanks. He could heartily endorse what had been stated by Mr. Gale as to the activity and energy which prevailed in America with regard to architectural and building matters. Great progress was being made by the architects on the other side of the Atlantic. A few years ago it was the habit of all architects in this country to say that no good thing architectural could come out of America, and the works of American architects were, as a rule, looked upon with contempt. But that feeling was fast dying out, for within the last three or four years the strides that had been made by American architects on the artistic side of their work were something wonderful, especially in regard to private residences. Within the period named there had been built in Boston, New York, and elsewhere, houses which, from an artistic point of view, it would be difficult to surpass, even in London. The Americans spent large sums of money on the interior finishings of their houses. They frequently spent 60,000*l.* or 70,000*l.* on the interior of one house. The fittings and joinery were generally of hard and costly woods, and the buffet was very often a part of the construction of the house. Two of the most noticeable and costly houses which had lately been erected were those of Whittier, a broker, and Mr. Vanderbilt. A visit to the mansion of Mr. Vanderbilt, he was bound to say was somewhat dazzling, so costly and rich were all the finishings and "appointments." Indeed, it was said in New York that several tradesmen had made their fortunes simply out of the furnishing of this mansion, which, by the bye, had for its principal entrance fac-similes of Ghiberti's celebrated gates of the Baptistery at Florence. As to the cast-iron construction of house-fronts, he (the speaker) had been much disappointed with it. He was in hopes that the Americans would have succeeded in evolving a style which would have been suited to the characteristics of the material, but all their attempts seemed to follow more or less closely the lines of stone-work, and being shams, they were, of course, failures. One of the most striking features to be observed in connection with the lofty buildings of New York and other American cities was the very general use of "elevators," or lifts, as we termed them. One or more of these elevators was to be found in every building, and being always in motion there was no waiting by passengers who wished to ascend or descend. The more general adoption of elevators or lifts in London buildings could not but be attended, in his (the speaker's) opinion, by great advantages, foremost amongst which would be the realization of rents for the upper floors of lofty buildings almost equal to the rents now obtained for ground or first floor suites of rooms. With regard to the Philadelphia public buildings, the lofty tower described by Mr. Gale was not yet built, and it was doubtful whether it ever would be built. The buildings themselves were very French in general massing and grouping, and their architect had evidently made particular study of the Tuileries, Louvre, and the new Hôtel Dieu. The detail, however, was indifferent, though not so very bad for America. The detail of the new Post-Office at Philadelphia, and of some other Government buildings in the States, was very poor, showing great poverty of invention. The explanation of this would appear to lie in the fact that all these large buildings were designed at head-quarters in Washington. He agreed with Mr. Gale that many of the large apartment-houses of New York exhibited great ingenuity of planning, and he was able to corroborate all that had been said as to the use of the telephone and other labor-saving appliances.

Mr. Gordon Smith, architect to the Local Government Board, said, with reference to the way in which things were managed in New York and other cities with regard to plumbing and drainage, that he thought it just possible that if all regulations for such works in London were administered by one central authority, such as the Board of Works, we might be able to do better than we now did. But he should like to know from Mr. Gale whether the Boards of Health of New York and other cities were harassed by the operations, just beyond the confines of the areas under their administration, of such a being as our own "jerry" builder?

The chairman, in putting the motion, said that, having had the advantage of travelling in America, though only for a short time, he was very much impressed by the "go-aheadedness" of the Americans. If a man in the States brought out a good invention connected with building or anything else, it was straightway adopted all over the country until something better was produced, when that, in its turn, was taken up. The Americans did not wait, as we in England did, for things to be perfected before they used them. The telephone, for instance, had been in common use in Detroit for two or three years, and householders who needed the services of butcher, baker, or doctor could, by making their desire known to the officials at the telephone-exchange, be "switched on" to the wires connected with shop or surgery, and so could give their orders or ask for advice without leaving their houses. Take, again, the electric light, which had been in general use in Detroit, for years, although the English were still waiting for it to arrive at perfection before adopting it. With regard to the subject of ventilation, as carried out at Dr. Hall's church, he (the chairman) could fully confirm what had been said by Mr. Gale. The only quarrel he had with the church was that it was too luxurious, for every person was provided with an easy chair. Not only in regard to ventilation, but in the matter of acoustics, Dr. Hall's church appeared to be perfect. It was built for a congregation of 2,000, but in a building of the same size we in England would pack at least 3,000 people into it. As to iron for the fronts of buildings, he was sorry to hear that his nephew (who was his pupil twenty-eight years ago) had become such a heretic as to adopt iron fronts. He had not done so when he (the chairman) visited Detroit. Long ago, in New York, the enormous store belonging to A. T. Stewart & Co., was entirely built of iron, and it was the most horrible and bald-looking building that could be conceived. With regard to comfort in dwelling-houses, in the coldest weather the indoor temperature was equably maintained at from 65° to 70°. The walls of the houses were so constructed that the occupants did not suffer from changes of temperature, as we did in this part of the world.

The vote of thanks having been agreed to unanimously, Mr. Gale, in reply, said he was unable to say whether there were jerry builders round about New York. If there were, he did not seek out their works as objects of study. As to iron buildings, it should be remembered that there were two methods of using it, one of which was seen in Stewart's store, where the entire front was of iron treated in imitation of stone, having columns of Classical character and elliptical arches, — the whole design being as unsuitable as it could be for iron; but in New York and other cities a better method of treating an iron-fronted building had sprung up, and he might plead for Mr. Gordon Lloyd to Mr. Christian and others that Mr. Lloyd's iron-fronted buildings were not attempts to reproduce architectural features in an unsuitable material, but they consisted in a combination of vertical and horizontal lines, with ornament which was suitable to cast-iron. With regard to the heating of buildings, it was effected in various ways, as by direct and indirect radiation from steam-pipes, by hot air, and by hot water. As to the heating of the iron-shell buildings to which Mr. McLachlan had referred, there was no difficulty whatever, for between the external skin of iron and the internal walls air-spaces existed, forming, in reality, a kind of hollow wall. Buildings, of course, suffered from great extremes of temperature, but so far as he could judge, the joints were so well lapped and checked in various places that they effectually resisted changes of temperature. With regard to the fire-proof encasement of iron columns and girders, the enclosing materials hermetically sealed up the iron-work, it being believed that where the air could enter fire could also make its way. Hence the iron-work in buildings so fire-proofed was not likely to suffer from rust. He was not concerned to defend the detail of the Post-Office at Philadelphia, but it ought in fairness to be said that other Government buildings erected under the superintendence of Mr. J. G. Hill displayed an amount of artistic taste considerably in advance of some of the buildings put forward as specimens of Government architecture. In conclusion, Mr. Gale said he agreed with a former speaker in commending the ingenuity of plan shown in the New York apartment-houses, which were well worthy of study in this country.

THE ILLUSTRATIONS.

SKETCHES AT ASSOS. BY MR. F. H. BACON, ARCHITECT.

COTTAGES AT NEWTON CENTRE, MASS., FOR H. P. CLARK, ESQ. MESSRS. LAMB & RICH, ARCHITECTS, NEW YORK, N. Y.

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Cottages at Newton Center Mass

For CHAS P CLARK Esq

Lamb & Rich Archts 346 348 B Way N Y

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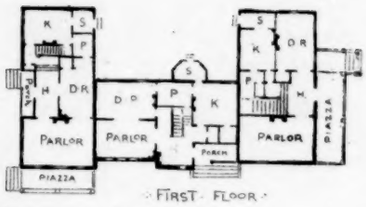

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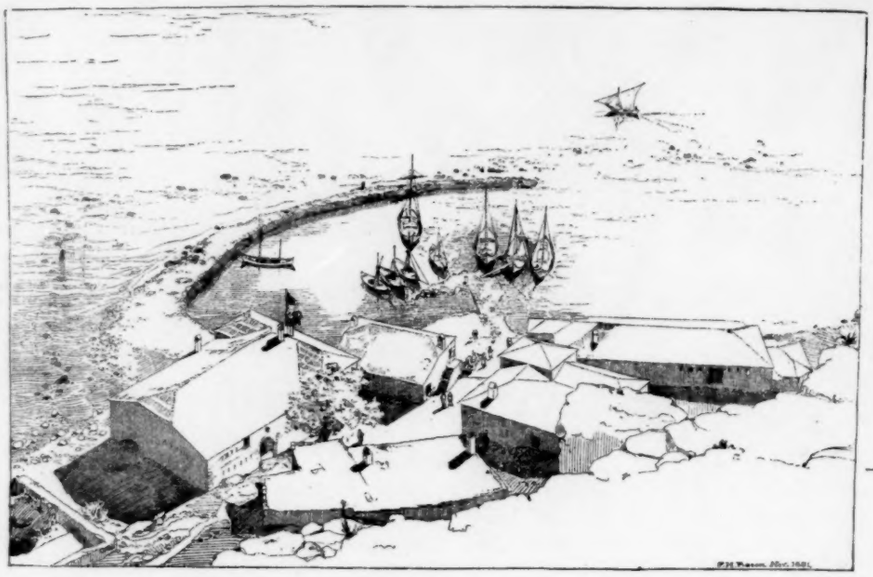

PLATE 36. PORT AND TURKISH MOLE.

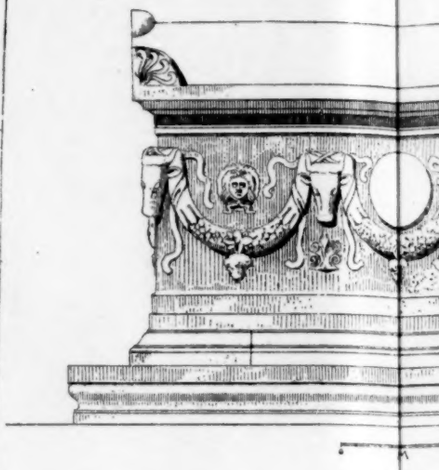

PLATE 34. SARCOPHAGU

Sketches a

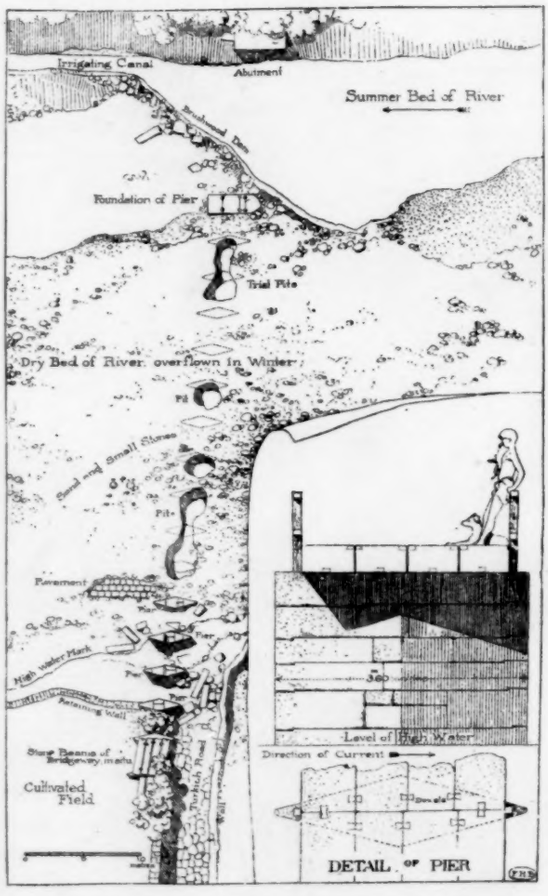

PLATE 35. BRIDGE ON THE SATNIOEIS.

PLATE 14. FRONT OF TEMPLE REST

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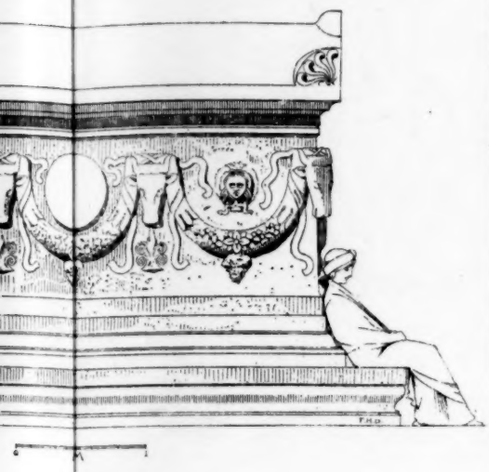

E 34. SARCOPHAGUS, RESTORED.

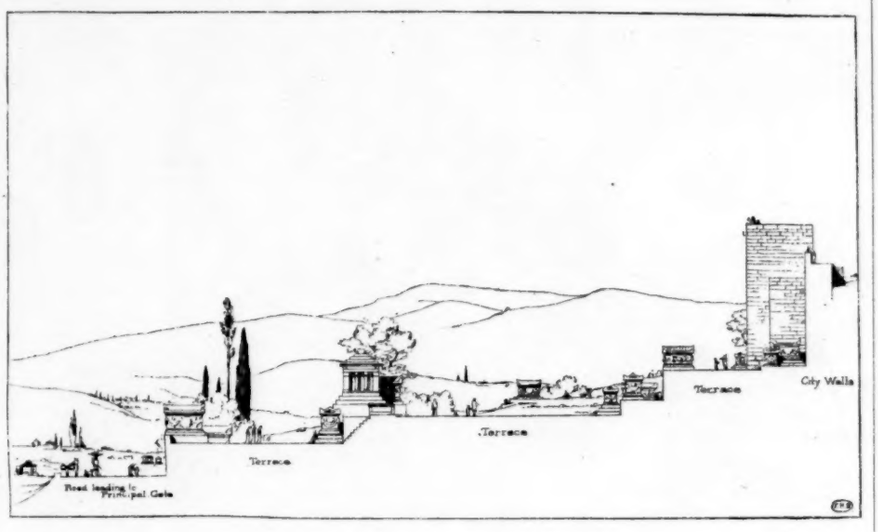

PLATE 29. SECTION OF CEMETERY, RESTORED.

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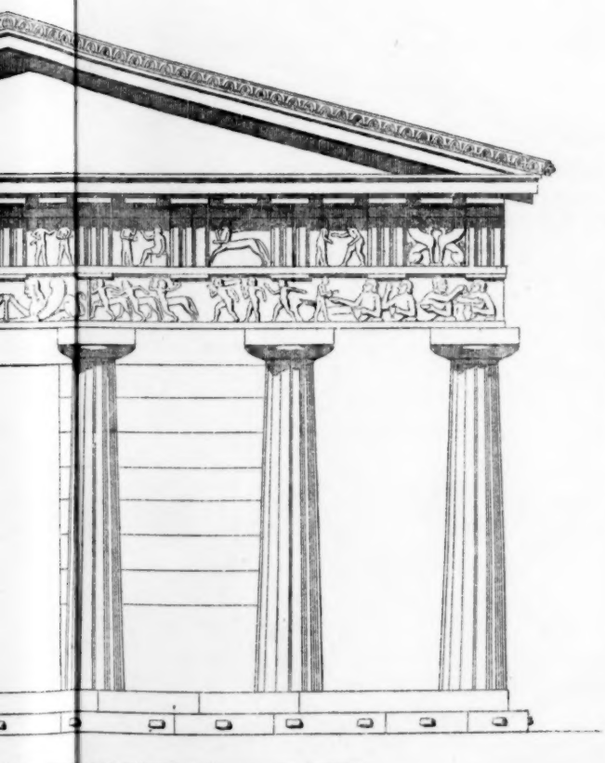
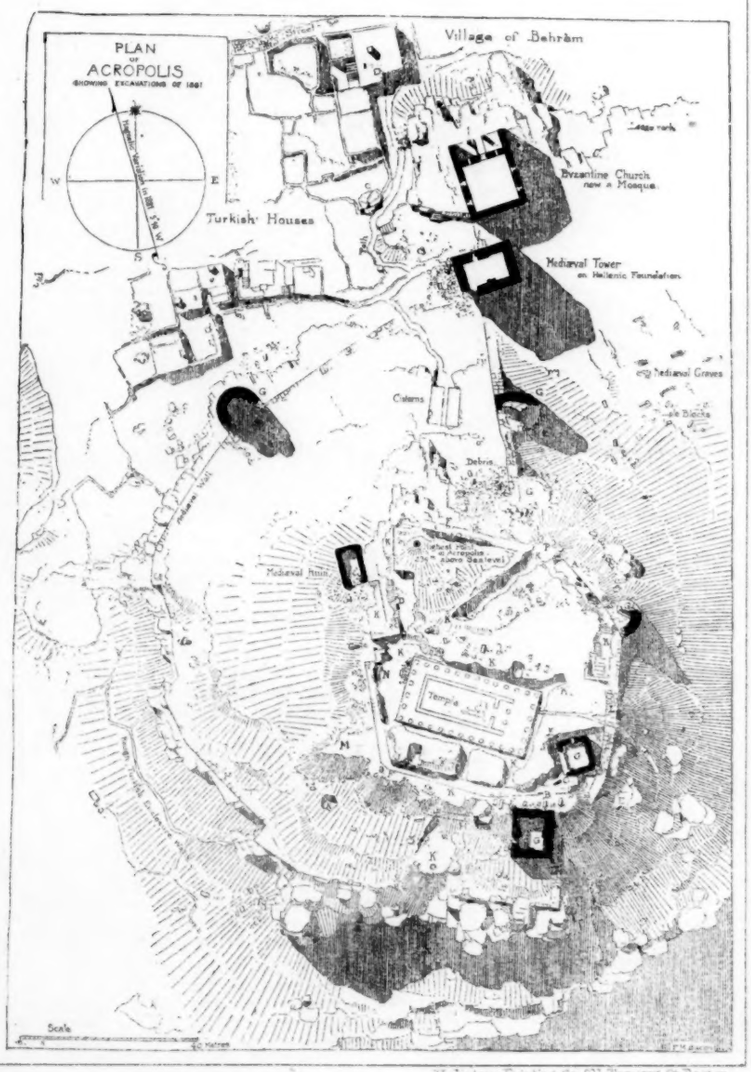


OF TEMPLE, RESTORED.



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BUILDING IN CINCINNATI IN 1882.

THE year of 1882 ends from an architectural stand-point about the same as several of its predecessors; that is, in a quiet, orderly and respectable manner, without any particular reason for a disturbance of mind or body on account of great good accomplished or of any unusual backsets. When we survey the year's record, however, it is with feelings of congratulation that while business has not been extraordinarily good yet it has not been extraordinarily bad: it might have been better, it might have been worse.

We have no means of knowing from any correct records kept by the city authorities the number and cost of buildings erected here, but the records kept form a basis of comparison, and so turning to them we find the following comparative statement for the past four years:

Year.	No. of Permits.	Cost.
1882	660	$1,952,300
1881	569	1,832,600
1880	636	1,521,700
1879	773	1,730,000

However, we are not left in the dark entirely as to the amount expended here in building, for we know that there were consumed about sixty-one million of brick last year, and that the cost per thousand laid in the wall would average $10, which would make the total cost of brickwork $610,000; and we know that the brickwork will average one-fourth the total cost of a building, so that this will give us in round numbers $2,500,000 expended in buildings during the year just ended, and this amount will not fall far short of the correct amount.

The past year will be remembered beyond all others, perhaps, for the number and large size of factories and warehouses erected. Probably more of this class of buildings were started or finished than in any previous year.

The new Art Museum, of which Mr. McLaughlin is the architect, is the only building of any great magnitude begun during the year. The foundations of this building have been contracted for and are being rapidly laid. The contracts for the superstructure will be awarded in the early spring.

The Government building still pursues the "even tenor of its way" toward a future completion. It has required about eight years in being born and reared to youth, and the supposition is that it will take eight years more before it will be full-grown and be of any particular use. At present the stone-work is finished, the roof is about half on, and the brick arches between the I-beams for the floors have been turned, but nothing in the way of inside finish has yet been attempted unless, perhaps, some iron door-frames that are put in place might be construed as inside finish.

Generally, the houses erected during the past year have been well designed and built, partaking principally of the Queen Anne style, of a modified form withal, as the extreme craze has not yet reached us. Pressed brick are being more generally used than ever before, and there is a marked improvement in the design and construction of houses of recent date over those of say, ten years ago, even by the same architect. Let us hope that the improvement thus made is as nothing compared to that which is to follow.

There can be no doubt but that the *American Architect* has done more than any other one cause to create, nurture and spread abroad this correct architectural feeling and taste, and this paper, together with the American Institute of Architects, is responsible for the better-designed and better-constructed buildings that we see around us so plentifully now, where they were so scarce a few years ago. At least this is the feeling in and about Cincinnati. C.

WORLD'S FAIR AT CALCUTTA.— Arrangements for holding an international exhibition at Calcutta in 1883 have been concluded.

A NEW FORM OF INSURANCE.—According to a Continental journal, an insurance company has been established in Paris under the title of "Le Bâtiment." This body undertakes in consideration of annual premiums the maintenance in good constructive and decorative condition of all kinds of buildings. It is stated that the principle of the association is to assure to householders a provision against being prevented by temporary want of funds from having to exercise economy which may afterwards lead to increased expense. The project is not very clear.

FORT ANCIENT.

THE fourth of the course of lectures complimentary to the subscribers to the exploration-fund of the Peabody Museum, given by Professor Putnam at the Museum in Cambridge, is reported in the Boston *Transcript*. The lecture was a consideration of some of the earthworks in Ohio, Tennessee and Illinois, and particularly of the largest, which is known as Fort Ancient. Professor Putnam said:—

Throughout the Ohio Valley and along the tributaries, such as the Great and Little Miami Rivers, the Muskingum and Scioto Rivers are numerous earthworks, most of which seem to have been fortifications, for the only general account of which I would refer you to "The Ancient Monuments of the Mississippi Valley," by Squier and Davis, published in 1848 as the first of the Smithsonian contributions to knowledge, in which will be found descriptions with plans of many of the earthworks of the Ohio Valley.

This diagram of a group of earthworks near Lebanon, Tenn., will serve to illustrate the general character of many similar places. An embankment encloses an irregular oval of about eleven acres in area. When the embankment was thrown up, it was probably near the banks of the stream called Spring Creek, but since its erection the creek has removed from its original bed about three hundred feet, cutting its way through a shelving limestone ledge, and is now bordered by a bluff of considerable height. This change in the bed of the stream furnishes a clew to the antiquity of the earthwork. The low embankment is surrounded by a ditch three or four feet deep, formed by removing the earth to raise the wall. There are three openings in the embankment, as if bridges might have been thrown over the ditch at these points. In the enclosure is a flat-topped mound two or three feet high, which exploration proved not to be a burial-mound, but probably the site of some structure. Near this large mound was a small one, only four or five feet high, containing sixty stone graves enclosing skeletons and objects buried with them. The little circles within the enclosure on the plan represent the sites of houses, like the earth circles described in the former lecture. Beneath the hard-clay floor, from one to two feet, the graves of children were found. It will thus be seen that this enclosure was a fortified village of about a hundred houses, protected by the ditch and embankment, perhaps also by palisades surmounting the embankment. Outside the enclosure are several mounds, which may have served as signal-stations.

At Newark, O., the earthworks covered an area of two miles square, and included, besides mounds, from fifteen to twenty miles of embankment, forming circles, squares, and other shapes, some of them enclosing from thirty to sixty acres, while parallel walls extended for about two miles. Of these embankments the highest is from fifteen to twenty feet high, and has a base sixty feet wide. These works do not seem to be of a defensive character, and although they may have formed a village site, they are generally believed to have been associated with the religious rites of the ancient people who erected them. A group at Portsmouth in some respects like that at Newark, probably served a similar purpose. It also had about twenty miles of embankment arranged as shown in this plan. A point of interest in the Portsmouth works is that they extend on both sides of the river, with parallel walls leading down to the river on either side, indicating the former presence of a bridge or easy crossing place. Unfortunately, only portions of the Newark and Portsmouth works are still preserved.

On the site of the city of Marietta, O., there were formerly two groups of square embankments enclosing a number of mounds, both flat-topped and conical. Outside the earthwork were several conical mounds, and the whole group has every appearance of having been the site of a fortified town. Many other groups similar to these occur in Ohio. Occasionally with the earthworks, walls of stone are found, as at one place on the Ohio river where an earth embankment is broken by a deep ravine across which a wall of stones seventy-five feet high was thrown, so uniting the interrupted earth wall.

A diagram of the great mound at Cahokia, Ill., opposite St. Louis, was next shown, in order to illustrate works of another character. This mound is to-day the largest in the United States, notwithstanding it has long been cultivated, and is much worn by repeated ploughings. It is ninety-seven feet high, and at different heights has several platforms or level places, each of considerable area. This mound was probably a village site, its steep sides serving for defence. When we consider that this mound covers an area of nearly twelve acres, and remember that all the earth composing it was brought a peck at a time in skins or baskets, we can form some idea of the labor expended in its construction.

Fort Ancient, Ohio, which is the special subject of my talk today, has given its name to the nearest railway station, some thirty-five miles northward from Cincinnati. It is built upon a hill running like a peninsula out from the plateau into the lowlands bordering the Little Miami river. This irregular-shaped hill was well-chosen for a place of defence, for it is nearly isolated by streams tributary to the Little Miami. The top of the hill is 230 feet above the high-water mark of the river, which it completely commands. At the nearest point to the river the slope is terraced. The embankment is formed of earth, not thrown up from a ditch, as there is no ditch here, but from excavations, now pond-holes, here and there inside the fort. Where the embankment has been carried over gullies, a foundation of stones was made. The length of the embankment was nearly five miles. In height it varies at different points, ranging from fourteen to twenty feet, with a base often sixty feet wide. The frequent changes in the direction of the embankment as it follows the outline of the hill give an additional means of defence against an attacking force. The two larger ends of the fort are connected by a narrow neck of land along both sides of which the embankment runs, while across it is carried an embankment as if to hold one end in case the other end of the fort should be taken.

Just outside the main gateway or opening at the northeastern portion, are two mounds, from which parallel walls run out for 1350 feet to enclose a third mound at the end. Unfortunately, the parallel walls are in cultivated ground, and are now nearly obliterated, but they can still be traced.

This place was first remarked in 1806, and was carefully surveyed by Professor Locke about 1840, of whose excellent plan this diagram is an enlarged copy with a few additional points of interest introduced. Inside the earthwork there is no doubt much of interest which would well repay careful exploration. At one end of the fort, enclosing about forty acres, is a very old burial-place, whether of the people who built the work or of comparatively recent Indian tribes I do not know. At the other end of the fort, after many years of cultivation, the plough has recently struck a number of large flat stones evidently forming a pavement. On walking about the walls, which enclose an area of about one hundred acres, you find yourself in what is termed the primeval forest, and as it takes a long time for a second growth to be replaced by the primitive type of forest, with its several varieties of trees, we realize to some extent the antiquity of this remarkable fortification.

In the tray upon the table are a few fragments of pottery found near the ancient stone graves within the fort. Some are cord-marked and others are incised. Besides the bits of pottery, I picked up a fragment of cannel coal which had been cut and smoothed, as well as several flint chips and two rude arrow-points. These may represent the work of the people buried in the fort, or they may be of more recent origin. To determine the relative antiquity of the fort, of the people buried in it, and of the surface finds, demands most careful and conscientious work.

The preliminary steps have been taken to secure this most extensive of ancient American works for a public park, subject to necessary restrictions in order to preserve it for all time to come. It has stood the wear and tear of centuries, but it will not long withstand the encroachments of the American farmer. Inside the embankment the trees have all been removed and little ditches have been cut for draining, while on the crest of the embankment a rail fence has been built to exclude the cattle. As a result, the cattle have made a deep gully beside the fence, which is fast causing the embankment to wash away. It is a sad sight to see this remarkable place going to destruction, and we owe it to those who are to come after us to save this monument of antiquity. Unless something is done at once for its preservation, it will soon suffer the fate of the ancient works at Portsmouth and Marietta, of which but slight traces remain.

AMERICAN SOCIETY OF CIVIL ENGINEERS.

December 20, 1882.

THE Society met at 8 P.M., Vice-President Wm. H. Paine in the chair. John Bogart, Secretary. Mr. Wm. P. Shinn, M. Am. Soc. C. E., read a paper on the "Increased Efficiency of Railways for the Transportation of Freight."

The first portion of this paper gave from carefully gathered statistics a valuable amount of information in regard to the actual increase of traffic on American railways. In 1860 the tonnage-mileage of the New York Central and Hudson River Railroad, the Erie Railway and the Pennsylvania Railroad was about equal, and amounted in the aggregate to a little over three-fourths of that of the New York State Canals, and in 1870, each of these railroads averaged about the tonnage of the canals, and in 1880 they averaged each nearly double that of the canals. The aggregate tonnage-mileage of the other railroads was, in 1881, 1217 per cent more than 1860. Statistics were also given showing the increase of population, of railroad mileage, of the production and export of grain and other leading exports. The means by which the rapid increase of freight transportation had been developed was considered under two general heads, namely, improvements in the physical conditions of the railroads, and improvements in the administration. The improvements in the physical condition were treated on under these heads:—

1. Improved track or "permanent way," including bridge structure.
2. Additional sidings, and second, third and fourth tracks.
3. Increased capacity and strict classification of locomotives.
4. Increased capacity of freight cars.
5. Additions to terminal facilities.

The improvements in the administration were referred to under the following heads:—

6. Improved methods of signalling.
7. Running locomotives "first in, first out," and running freight trains at higher rates of speed.
8. Consolidation of connecting lines under one management by purchase, lease, amalgamation, or otherwise.
9. Running freight cars through from point of production to tide-water without trans-shipment.
10. Issuing through bills of lading (or freight contracts) from Western points of shipment to Atlantic and European ports.

The general introduction of steel rails was stated to be the very corner-stone of increased efficiency. The improvements in all the directions referred to were treated of and described at considerable length.

The second portion of the paper presented the views of the writer as to the means whereby still greater efficiency could be most economically obtained. The constant demand is for more transportation facilities for more cars. In the opinion of the writer, what is needed is not so much more cars as more movement of cars. Freight blockades will be prevented, not by having more tracks to stand cars upon, but by having fewer standing cars. It was shown that upon one railway there had been a decrease in the miles run by the cars of 21 per cent between 1868 and 1881, and that the Union Line cars between 1879 and 1882 were increased 49 per cent in number, while the mileage run by them decreased 16 per cent in the same period. The remedies suggested by Mr. Shinn were, more main tracks, more locomotives, more trains, the improvement of the making up of trains at the points where cars are loaded. The detention of cars at stations and private sidings, and the absence of cars on foreign railroads were considered as among the greatest causes of loss, and the writer suggests that the remedy will be to charge a per diem charge for cars when on foreign roads, and that this charge should be based upon the average economic value of the cars in use to their owners.

DECORATION OF ST. PAUL'S CATHEDRAL.[1]

THIS the author held to be the most absorbing art-topic of the day, and since the verdict of posterity depended on the success of the present generation in solving the problem, it behooved them to mark with a watchful eye every step taken, lest anything irremediably wrong should be done. The Cathedral authorities intended to submit the scheme for the decoration of the dome — the only part it was at present proposed to complete — to the public judgment before undertaking anything final. With such great interests at stake it was plainly most important that the public, who were to be the ultimate judges, should be kept well informed by the friendly discussions and enlightened criticisms of those most competent to form a correct opinion about the decoration of a church. In other words, duly qualified public opinion was that of a body of men of educated taste. Taste the author defined as the faculty of being able to discern beauty in nature and art — a definition which he defended and illustrated at sufficient length. In matters of architectural art where could the most competent judges be found if not amongst the members of their own Institute — men versed in niceties of style and modes of construction, gifted with an eye for form and color, who, by daily practice, by study, by travel, were the likeliest to have become men of cultivated taste?

[1] A paper read by Mr. R. P. Pullan, F. R. I. B. A., before the Royal Institute of British Architects, and published in its *Proceedings*.

Before that body, therefore, the author proceeded to lay the facts connected with the rise and progress of the movement. He did so with a view to showing that the steps taken hitherto had not been wisely taken and were likely to lead to results unsatisfactory to the world of art. The audience having been reminded that the decorations of St. Paul's are in the hands of a Sub-Committee, the author, whilst acknowledging the courtesy he had received from its individual members, felt bound to criticise their collective decision, in meeting with a polite *non possumus* a request laid before them by himself to consider another design to that adopted from Mr. Stephens as the basis of their own. Committees on art matters, as those present knew from sad experience, often, nay usually, arrived at decisions inimical to art and artists, and were sometimes guilty of injustice, chiefly because no member could be made individually responsible. Wren, himself, was much thwarted and persecuted by the Commissioners for the completion of our national Basilica. In an extant letter he pathetically complains that the painting of the cupola was taken out of his hands. Mr. Pullan referred to Sir Christopher's successive ideas as to the proper mode of decorating the dome, and spoke of Sir James Thornhill's paintings in the Cathedral, Greenwich Hospital and other buildings. He deemed it fortunate that Sir Joshua Reynolds's suggested realization in 1773 of Wren's desire by Members of the Royal Academy, six of whom volunteered their gratuitous services, fell to the ground. Otherwise, we should have had a medley of style and coloring which would have gone far to destroy the effect of the architecture. There would have been seen Sir Joshua's gentlemanly saints and West's namby-pamby scriptural subjects ranged side by side with Barry's bold martyrs, Angelica Kauffmann's delicate virgins, and, later on, Fuseli's grim demons. In 1853 Mr. Parris was employed to restore Thornhill's pictures. In 1858 Dean Milman, writing to the Bishop of London, urged that the adornment of St. Paul's should be carried out in a rich and harmonious style. An appeal was at once made to the wealthy citizens of London, and in a short time £24,000 was raised. By 1871 the subscription had reached £40,000. Thanksgiving Day for the recovery of the Prince of Wales sent up the fund to £56,000. With such large resources at their disposal, the Committee were on the look-out for a suitable design, and Mr. Burges, who had been appointed architect to the Cathedral in 1873, was instructed to prepare one, which was to be subject to Mr. Penrose's criticism. When it appeared, in the form of a model, at the Exhibition of the Royal Academy in 1874, it unchained the winds of controversy between High Church, Low Church, and No Church, and the battle of the styles was renewed. Mr. Penrose exhibited a rival design. Some of the contributors threatened to withdraw their subscriptions unless Sir Christopher's intentions — though nobody knew what these were — were carried out. The minority of the Committee vigorously protested, in June, 1874, against the majority's decision. All these influences told against the Cathedral architect, and in November of the same year the Dean and Chapter resolved to rescind the agreements made with Mr. Penrose and Mr. Burges. In Mr. Pullan's judgment there were many good points in the designs of both, and but for the violence of party spirit the work might have gone on. After the rejection of these designs there was a truce until 1876, when Mr. Oldfield published his very able letter to the Dean, in which he revived the whole subject. Of this pamphlet, and of its bearings on the problem of the decoration of St. Paul's, Mr. Pullan gave some account. He was, however, greatly scandalized by Mr. Oldfield's last recommendation to his colleagues on the Sub-Committee, which they had adopted. By it they were urged to dispense with an architect, and so to save money, whilst at the same time eliminating a frequent cause of divisions amongst their subscribers. Having repudiated architects, continued Mr. Pullan, they sought for a design from other sources, and at last unearthed a model on which Stevens, a sculptor lately deceased, had left some rough indications of his notion about the decoration of the dome of St. Paul's. The discovery of this model at that critical juncture was most opportune for them. It was a tower of defence for them against their foes. And they further strengthened their position by forming an alliance with the two greatest English painters of our day, Sir Frederick Leighton and Mr Poynter. With both of these eminent men they made a formal agreement stipulating that Stevens's design should be taken as a basis; that a full-sized colored cartoon should be placed *in situ*, one portion of which was to follow literally or with some modification Stevens's design, the other portion being of a more conventional or architectural form; but in any case Stevens's arrangement to be worked out and the frame to be filled with pictures, the subjects of which to be taken from those suggested by Mr. Oldfield in a second letter to the Dean — namely, scenes from the Apocalypse. The Dean and Chapter sanctioned the experiment, reserving to themselves full power of discussing the matter, and also of rejecting the cartoons if they should be unsatisfactory. Now what, asked Mr. Pullan, was Stevens's model? A half-dome on which were sketched roughly Titans, Telamones, angels and squatting figures arranged to form something like ribs, with circular medallions on a plain gold ground to receive the cartoons. The design was without any architectural character, the dream of a man who had Michael Angelo on the brain, and who was thought a man of the greatest genius, because he had executed a monument, full of fine details, to be placed in a position where they could never be properly seen. This was the Wellington monument—a canopied tomb adorned with groups of figures so placed that little beyond the soles of their feet could be visible to the spectator. This tomb was to have been crowned with an equestrian statue of the great captain whom it commemorated, placed in such a lofty position that his nodding plumes would almost have swept the ceiling of the Consistory Court. This figure, however, the artist was compelled by public opinion to omit. The result was the leaving out of the crown of the design, which was thus made to finish in a plain table top. Neither in the Wellington monument nor in the model for the dome did we recognize that perception of the fitness of things which was wont to characterize the man of the highest genius. Sir F. Leighton and Mr. Poynter, Mr. Pullan contended, ought never to have been pledged to adapt their pictures to Stevens's crude frame-work, which, with whatever proposed modifications, would always remain unworthy of the productions of their pencils. The prescribed selection from the Apocalypse of the figures to fill the upper and lower circles was no less severely and sarcastically criticised. It was objected that a more mystical subject, one less fitted for popular instruction or less likely to inspire devotion, could not have been chosen than that whose study had been said either to find or leave a man mad. Unless it had been meant to divert people's minds at sermon time, to occupy their thoughts with paradox instead of orthodoxy, one was at a loss to conceive how Mr. Oldfield came to pitch upon such a subject. Mr. Pullan spoke next of the genesis of the rival design, jointly prepared by himself and his brother architect and friend, the late Mr. Heath Wilson, of Florence. It was welded together in the fierce heat of their indignation on finding, when the Sub-Committee's report reached them in Italy in the summer of 1878, the architectural profession altogether ignored. The fundamental principles which guided the two friends in the production of their design[1] were then expounded and illustrated at large by the survivor, who afterwards read a description of it from the able pen of his late colleague. According to Mr. Heath Wilson, the Court of Heaven, as described in that grand triumphal hymn, the "Te Deum," commended itself to the judgment of the two friends, as offering subjects individually graphic, appropriate and impressive, and which, when united, might be brought effectually within the strict conditions of decorative art. They aimed at an embodiment of prayer, praise and thanksgiving as expressed in the "Te Deum." They prepared a drawing—one-sixth of the full size — of an eighth part of the dome, proposing to divide the entire circle into eight equal parts, by means of ribs, richly decorated and of large proportions. These would spring from eight thrones, each filled by a seated prophet, a figure, which, if erect, would be eighteen feet in height. These would form noble themes for a great artist's powers of design, admitting of exalted idealism and thoughtful action, combined with religious sentiment and fervor. The angels erect over the thrones, with extended wings and hands pointing heavenward, typified the union of the prophets with the spiritual world. Considered in a decorative sense only, these angels placed like statues round the dome resembled each other, yet with some variety of action, whilst their brilliant garments and wings contrasted with the rich, dark tones of the ribs. These dividing ribs bent inwards towards a common centre; they had foliated capitals at their summits, supporting an arcade, over which, surrounding the aperture of the dome, was an entablature, adorned in the frieze, pendentives and arches beneath, with winged cherubs, seraphs, and appropriate decorations of the usual forms and colors. The section of the visible portion of the outer dome could not be shown, but brilliant gold grounds were contemplated, to contrast with the azure beneath, embellished with heads of angelic beings, and in the summit of the lantern, as apex of the design, was to be the Lamb, as usually represented in Christian iconography. The spaces between the ribs were occupied in the lower portions of the curve of the dome with an architectural composition in two zones, consisting of a podium or basement with a corridor above, intended to recall in a measure the general design of Sir James Thornhill, which may have been approved by Sir Christopher Wren. This structure, with a baldacchino in each central space, was meant as background to the figures thronging this portion of the cupola. An Apostle was enthroned under each baldacchino: "The glorious company of the Apostles praise Thee." The martyrs were grouped on each side and in front of the basement: "The noble army of Martyrs praise Thee." The architectural forms, the ascending aërial perspective of which had been graduated with much care, were relieved against the pure azure of the whole upper curvature of the dome, on which depended, in considerable measure, the beauty of this part of the design. As the azure ascended it grew paler, till it melted into pure white. On the surface of this azure were ranged angels, excelling in brightness as they rose rank above rank, illustrating the verse of the hymn—"To Thee all Angels cry aloud." Recalling an arrangement in the Cathedral of Orvieto, it occurred to the designers, in this also following still more ancient examples, to place the virgin martyrs apart. They were placed under the corridor, but it was not to be understood that these figures were arranged in an arbitrary and final order. The design was a first composition, in which the authors had been more impressed with the importance of demonstrating the great leading principles of monumental and decorative art than in fixing any precise garland of verses from the hymn itself in this first essay. They had introduced Angels and other heavenly powers,

[1] Mr. Pullan exhibited a large painting of this design by the late Mr. Heath Wilson and himself.

Apostles, Prophets and Martyrs as appropriate and as eminently suitable for decorative treatment, but they were conscious that other noble themes presented themselves, especially in the verse, "The Holy Church throughout all the world doth acknowledge Thee." This subject, but for press of time, would have received their earnest attention and study; for when one considered the vast extent of the British Empire, and the number and variety of races under its sway, one grew sensible of the fitness of recalling, in our chief national temple, the great national duty of gathering in these peoples; the verse quoted offered a magnificent subject for illustration, and for introducing members of various races of mankind to be "numbered with Thy saints in glory everlasting."

NOTES AND CLIPPINGS.

Destruction of the Gate of St. Georges, at Nancy. — France sorely needs a Society for the Protection of Ancient Buildings. Scarcely is the demolition of the beautiful Saracenic Cathedral of Périgueux complete when we are informed that M. Duvaux, the new Minister of Instruction and Fine-Arts, has authorized the destruction of the old gate of St. Georges, at Nancy. This gate is almost intact. It was built in 1608, by Charles III, Duke of Lorraine, and is almost the only portion of Nancy, as he left it, which remains. The Commission des Monuments Historiques, which does not possess quite the weight or prestige which we could desire for it, has appealed against the act, and a strong movement is being made to induce the Government to reconsider the matter. Four years ago the demolition of this monument was delayed by the representations of the inhabitants, and Victor Hugo at that time wrote a letter pointing out that the Porte Saint-Georges was one of the most charming buildings of the Renaissance, and demanding its preservation. This letter is now being printed and circulated by a committee of the townspeople of Nancy, and will probably figure prominently in the interpellation of which MM. Clovis, Hugues, and Antonin Proust have given notice to the Chamber. — *Pall Mall Gazette.*

How the Pictures in the Louvre are Cleaned. — A correspondent of the Philadelphia *Evening Bulletin* has taken the pains to find out how the galleries and the pictures in the Louvre are kept clean. On Mondays the palace is closed; it is then that the weekly cleaning takes place. The first thing done is to cover the floor with damp sawdust to the depth of an inch or so. Oak sawdust is used for the boards and elm dust for the marbles. This is allowed to remain some time and is then removed, and with it goes every particle of dust or dirt which may have adhered to the floor. Then the men buckle on to their feet large stiff brushes, and, armed with a stout stick, to one end of which is fastened a great piece of prepared beeswax, they first rub the floor with wax, then skate over it with their brushes, and finally give it the finishing polish with a great woollen cloth made expressly for this purpose. The same cloth is passed daily over the floor before the opening of the museum, which is all that is required until the following Monday. In this way no dust arises, and the pictures need rarely to be cleaned. When this becomes necessary, which happens about once in four or five years, the museum is closed for several days. No one is allowed to touch a picture unless the "conservateur du musée" be present. The pictures are taken down, and it is the "conservateur" himself who places a thick sheet of clean wadding over the painting, pressing it down gently in such a way that every particle of dust adheres to the wadding. After this is done a thin coat of oil or some mixture which replaces it is rubbed on, and the picture is not again touched until the next general housecleaning.

Armenian Antiquarian Discoveries. — The *Allgemeine Zeitung* announces that a discovery, the importance of which can hardly be overrated, has been made lately by a Bavarian archæologist, Herr Sester, at the point where the Euphrates bursts through the Taurus range. Here, in a wild, romantic district, lying between Madatieth and Sanisat, he found a line of megalithic monuments, averaging between 16 metres and 18 metres in height, and bearing inscriptions. They are in a remarkable state of preservation, and Herr Sester has no doubt that they formed part of some great national sanctuary, dating back some 3,000 years or more. There was formerly at this place a necropolis of the old Commagene kings, so that it seems reasonable to attribute these colossal monuments to this ancient people, the hereditary foes of the Assyrians. Very little is known about them. The classical writers allude to them only in casual passages, and the arrow-headed inscriptions, although mentioning them very often, have hitherto yielded scanty information. Herr Sester purposes visiting the place next year, accompanied by Dr. Puchstein, a pupil of the Berlin Archæological Institute. Meantime, it is conjectured that they will be found to belong to the class of remains which Professor Sayce has designated "Chettite monuments," all that has come down to us from the once powerful race of the Chetta or Chatti.

How the Louvre gains a Collection. —Prince Filangeri, of Naples, has just experienced the rapacity of Italian tax-gatherers, and is greatly displeased. *The London Globe* relates that he "had offered his splendid museum of antiquities and works of art to Naples as a free gift. The offer was, of course, accepted, and the municipal authorities addressed to their benefactor a most gracious letter of thanks. But the Commissioners of Inland Revenue addressed to the Prince a demand which altered his views. This was nothing less than a request for 300,000 lire on account of the tax upon alienation in respect of his gallery." Prince Filangeri on receiving the notice at once went to the Minister of Finance in Rome and said: "I am resolved that on no consideration, cost me what it may, shall the town of Naples have a bronze or a statuette out of my collection. I am offered three rooms at the Louvre in Paris, and to them I shall transfer my galleries. But on the doors of the collection, when there displayed, will be found a placard to this effect: 'This museum was intended for the town of Naples; the rapacity of the Italian Treasury forced the owner to send it to a foreign country.'"

Manufacturing Alumina.— An invention which it is believed will effect important changes in the metal trade, not only in this country but throughout the world, has recently been patented in Great Britain and most foreign countries, and is now being sold as an article of commerce. The invention consists of a new method of manufacturing alumina by which nine-tenths of the present cost are saved, while it can be made in immense quantities in the course of a few days instead of requiring nine months to produce it, as was formerly the case. The inventor is Mr. Webster of Hollywood, near Birmingham, who has been engaged in experiments since 1851, and only succeeded in perfecting his process about twelve months ago, after having expended nearly £30,000 in the experiments. Prior to this invention, alumina was made only in France, the attempt to introduce the manufacture into England having failed after the promoters had lost upwards of a million of money. The extent and value of the discovery may be gathered from the fact that a French syndicate have offered nc less than nearly half a million for the patent rights in France alone, and companies in the United States have offered £1,000,000 for the right of manufacture in America, while the Belgians and Germans are also negotiating for the purchase for their respective countries. The ordinary method of making alumina is by precipitation, and the cost is no less than £1,000 a ton, whereas by Mr. Webster's process the cost is reduced to less than £100 a ton. When converted into aluminum and alloyed with copper, tin and other alloys, it produces a bronze metal which is considered to be superior to anything in use for ship fittings, steam-ship propellers, and also for the manufacture of artillery. Although it has only just been placed in the market, the bronze is in extensive demand by ship-builders, and the British Government are in treaty for a supply of the metal to the Royal Gun Factory at Woolwich. A scientific analysis shows that the aluminum bronze has a resisting power of forty-two tons per inch as compared with twenty-eight for gun-metal and thirty for Bessemer steel. At the same time it is exceedingly ductile and tenacious, and when used for ships, will bend rather than break from the force of a collision. The metal is supplied in ingots, rolled into sheets or drawn into wire. In its different forms it may be used for all purposes for which electro-plating is now employed, also for pen-making, nail-making, bell-founding, and even for jewelry. Rings of the aluminum bronze set with precious stones are in vast demand for the United States, and spoons, knives and forks, dish-covers, railway-carriage door-handles and other articles made from the metal are in extensive inquiry in this country.—*Birmingham Correspondent London News.*

Furnace Slag and Bauxite for Cement.— We learn from *Stahl und Eisen* that Herr Roth, mining engineer, of Wetzlar, uses bauxite in the manufacture of cement from blast-furnace cinder. Bauxite consists principally of alumina hydrates, besides small quantities of sesquioxide of manganese, titanic acid, lime, magnesia, alkali, etc., but its chemical composition varies according to the localities where it is deposited. Its name is derived from the place where it was first discovered, Les Baux, in France; it also occurs in the Charente. In Italy it is found in Calabria; in Ireland, near Belfast; in the Austrian Empire, in Krain, Styria, and Lower Austria. In Germany bauxite occurs on the southern slope of the Westerwald, near Mühlbach and Hadamar, also at the Vogelsberg, in Upper Hesse, and at Klein-Steinheim, near Hanau. If 100 parts of furnace cinder, which crumbles by itself, are mixed with 85 parts of limestone or chalk (containing 98 per cent of carbonate of lime and 2 per cent of silicic acid), and 15 parts of bauxite (containing 48.5 per cent of alumina, 13.52 per cent of sesquioxide of iron, and 9.40 per cent of silicic acid, the composition of the bauxite found near Giessen), and burned, the product yielded—supposing that half of the sulphur escapes from the slag as sulphurated hydrogen — is 158.66 parts of cement of the following composition: Lime, 61.9 per cent; silicic acid, 24.1 per cent; alumina, 10.6 per cent; sesquioxide of iron, 1.3 per cent; protoxides of iron and manganese, 0.8 per cent; magnesia, 1 per cent; sulphur, 0.3 per cent. The cinder used was obtained in the production of foundry pig in a coke blast-furnace. If the cinder to be employed is of a different composition, the fluxing materials must be varied. Herr Roth demonstrates the economical advantages to be derived from the erection of special cement mills near blast-furnaces.—*Van Nostrand's Engineering Magazine.*

Veneering. — Veneering, says the London *Furniture Gazette*, seems to have originated contemporaneously with the art of cabinet-making. The superimposing thin layers of choice wood upon articles made of common timber was in use among the Egyptians some 1,500 years B. C. Recent advances made in veneering furniture and cabinet-work are said to be noteworthy. One process of making veneers, invented by a German, is detailed at length as to its results. The method is said to be secret. The production is said to be practically a "paper veneer." Several varieties of choice woods of considerable thickness are "inlaid" to form a pattern. Thin layers of these produce fine effects, and may be used for a large variety of purposes, extending to dadoes, friezes, table-tops, wall-coverings and the like. The opportunity for skill and ingenuity to produce rich effects in the combination and blending of the different woods, together with the patterns formed, is readily perceived to be large.

Systematic Station Building on the C. P. Railroad. — When the building superintendent of the Canadian Pacific commenced the work of erecting stations on July 1, the track-layers were over 100 miles in advance of him, but at the close of the year the last station will be built at the end of the track. During the season he has constructed twelve stations, twelve section-houses, eleven permanent water-tanks and sixteen temporary ones. He has had a force of 250 men in his employ, and his pay-roll has amounted to $16,000 per month. His plan of operations has been similar to that employed in track-laying. One gang of men would be detailed to erect the frame of a station-house, and then sent on to the next point, while their places would be filled by the next carpenters, roofing in the building, putting in the floors, etc., who would in turn be superseded by the joiners and plasterers This course was followed throughout the season, four or five buildings being in process of construction at the same time, thus avoiding delay.

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

269,824. KEY-HOLE GUARD. — Joshua Brown, Quincy, Mass.

269,849. COMPOUND FOR THE MANUFACTURE OF ARTIFICIAL STONE. — Joshua A. Greer, Galveston, Tex.

269,855. SAFETY-APPLIANCE FOR ELEVATORS. — Lionel H. Heynemann, San Francisco, Cal.

269,859. NAIL. — John H. Hughen, Athens, Ga.

269,860. ORAL ANNUNCIATOR. — Joseph Ireland, Cleveland, O.

269,862. ELECTRIC BURGLAR-ALARM. — Charles Temple Jackson, New York, N. Y.

269,863. IRON AND ILLUMINATING STAIRS. — Peter H. Jackson, San Francisco, Cal.

269,873. HEATING-FURNACE. — Henry W. Michael, Denver, Col.

269,902 SOCKET-WRENCH. — Henry Wheeler, Chambersville, Mo.

269,921. CISTERN FOR WATER-CLOSETS. — John Demarest, New York, N. Y.

269,930. AUTOMATIC FIRE-EXTINGUISHER. — Alphonso S. Harris, Chelsea, Mass.

269,965. PNEUMATIC FIRE-EXTINGUISHER. — William Sellers, Philadelphia, Pa.

269,967-968. BENCH PLANE. — Jacob Siegley, New York, N. Y.

269,983. HOUSE-COOLING DEVICE. — Andrew Zerban, New York, N. Y.

269,986. SPRING-HINGE. — James H. Alexander, Philadelphia, Pa.

269,994. ELEVATOR. — Walter M. Bailey, New York, N. Y.

270,008. LADDER. — Charles Bridges, San Fernando, Cal.

270,010. FIRE-EXTINGUISHER ALARM APPARATUS. — Albert M. Burritt, Waterbury, Conn.

270,011. FIRE-EXTINGUISHER. — Albert M. Burritt, Waterbury, Conn.

270,027. WINDOW-SHUTTER OPENER. — John J. Donahoe and Peter J. Finn, New Orleans, La.

270,034. MERCURY-SEAL-JOINT TRAP FOR BATH-TUBS, ETC. — Abraham Edwards, Asbury Park, N. J., and Samuel J. Van Stavoren, Philadelphia, Pa.

270,038. EAVES-TROUGH HANGER. — Henry J. Erwin, Marysville, O.

270,044. DOOR-CHECK. — F. William Fieder, Chicago, Ill.

270,047. IRON SHUTTER. — Newman A. Foss, Gold Run, Mont.

270,053. STEAM-RADIATOR. — Patrick Gormly and Lewis Bridge, Philadelphia, Pa.

270,066 COCK AND FAUCET. — Francis Hickman, New York, N. Y.

270,072. BIT-STOCK. — William A. Ives, New Haven, Conn.

270,080. WATER-CLOSET. — John Kelly, Chicago, Ill.

270,097. HYDRAULIC CEMENT. — John Murphy, Columbus, O.

270,111. TRAP FOR WASH-STANDS, ETC. — Charles F. Pike, Philadelphia, Pa.

270,112. SEALING DEVICE FOR THE OPERATING MECHANISM OF WATER-CLOSETS. — Charles F. Pike, Philadelphia, Pa.

270,113. WATER-CLOSET. — Charles F. Pike, Philadelphia, Pa.

270,118. APPARATUS FOR CLEANING CISTERNS. — W. M. Prather, Kansas City, Mo.

270,127. HEATING-FURNACE. — David W. Robb, Amherst, Nova Scotia, Can.

270,132. ILLUMINATING-TILING FOR VAULTS, ETC. — C Hansen Ross, Chicago, Ill.

270,151. PLASTIC COMPOUND FOR ROOFING. — Chas. Taylor, Montreal, Quebec, Can.

270,175. FIRE-BRICK. — William Batty, Philadelphia, Pa.

SUMMARY OF THE WEEK.

Baltimore.

CHURCH. — Mr. George A. Frederick, architect, has submitted drawings for an alteration in the tower and spire of the German Evangelical Church on Canton Ave., near Broadway; cost, $8,000.

HOUSE. — Mr. Chas. L. Carson, architect, has prepared drawings for a three-st'y and mansard residence, 25' x 103', on Eutaw Pl., for Mr. Frank, of Messrs. Frank & Adler, of this city; cost, $35,000.

WAREHOUSE. — Corner Light and Balderston Sts., for Mr. Albert Gottschalk, 37' x 117', brick, with brownstone and terra-cotta finish; cost, $50,000; Geo. A. Frederick, architect.

BUILDING PERMITS. — Since our last report ten permits have been granted, of which the following are the more important: —

Wm. Brown, two-st'y brick building, w s Parrish Alley, between Winchester and Tennant Sts.

Jos. Rosenberger, three-st'y brick building, with two-st'y brick back building, e s Central Ave., between Hoffman and Oliver Sts.

Wm. Roehler, three-st'y brick building, n s McElderry St., between Choptank St. and Madison Alley.

C. F. Richter, 7 three-st'y brick buildings, with two-st'y brick back buildings, w s Druid-Hill Ave., between Roberts and Laurens Sts.; and 7 three-st'y brick buildings, with two-st'y brick back buildings, s s Roberts St., between Druid Hill Ave. and Etting St.

Benj. R. Schneider, three-st'y brick building, s s Chase St., w of Valley St.

———, 3 three-st'y brick buildings, with two-st'y brick back buildings, e s Pennsylvania Ave., between Mosher and McMechen Sts., and 3 two-st'y brick buildings in their rear, on w s Bouldin Alley.

Wm. H. Wehn, 2 three-st'y brick buildings, with two-st'y back buildings, n s Fayette St., between Mount and Fulton Sts., and 3 three-st'y brick buildings, w s Mount St., between Fayette and Lexington Sts.

John W. Gibbs, 2 three-st'y brick buildings, with two-st'y brick back buildings, w s Carey St., between Pratt and Lombard Sts.

ALTERATION. — Mr. L. Meyer is making an alteration and addition to his store, on Hanover St., near Pratt St.; cost, $4,000; Mr. Briel, builder; Geo. A. Frederick, architect.

Boston.

CONTRACT. — The contract for plumbing-work on the sub-treasury extension of this city has been awarded to Dalton & Ingersoll, at their bid of $10,095.34.

Brooklyn.

BUILDING PERMITS. — *Floyd St.*, s s, 425' e Sumner Ave., 2 three-st'y frame tenements, tin roofs; cost, each, $4,000; owner, Chas. Maurer, Floyd St.; builders, Geo. Straub and J. Rueger.

Hooper St., n s, 100' e Bedford Ave., 2 three-st'y brownstone front dwells., tin roofs; cost, each, $6,000; owner, Fredk. Hoeft; architect, E. F. Gaylor.

Atlantic Ave., s s, 236' e Rockaway Ave., 4 two-st'y frame tenements, gravel roofs; cost, each, about $2,500; owner and builder, Chas. J. Holmmer; architect, F. F. Thomas.

Central Ave., No. 78, 75' s e Melrose St., three-st'y frame double tenement, tin roof; cost, $4,000; owner, John Schnappauf, 266 Meserole St.; architect, G. Hillenbrand; builder, D. Kreuder.

Plot 400, n Greenpoint Ave., and about 250' w Newton Creek, one st'y brick building, gravel roof; cost, $3,850; owner, Central Refining Co., Greenpoint; architect, G. H. Budlong; builders, J. Rooney and T. Davis.

Fourth Ave., s e cor. Seventh St., 3 three-st'y brick tenements, gravel roofs; owners, L. J. Praether & Co.; architect, L. J. Praether; builders, M. Sohirop & Co.

Lafayette Ave., n s, 100' w Lewis Ave., 16 two-and-a-half-st'y frame dwells., tin roofs; cost, each, $3,500; owner P. F. O'Brien, 162 Hewes St.

Suydam St., n s, 100' e Broadway, 2 two-st'y frame tenements, tin roofs; cost, each, $2,800; owner and builder, Fr. Herr, 778 Broadway; architect, W. Clemett.

Plot, 500' n Greenpoint Ave., and about 250' w of Newtown Creek, one-st'y brick boiler-house, gravel roof; cost, $6,250; owner, Central Refining Co., Greenpoint; architect, G. H. Budlong; builders, Jas. Rooney and Thos. Davis.

Twentieth St., s s, 275' e Third Ave., 2 three-st'y frame tenements, felt roofing; cost, each $3,000; owner, Wm. H. O. Greene, 230 Twentieth St.; architect, Wm. Wirth; builders, A. McGrath & J. R. Greene.

Third Ave., n e cor. Fortieth St., three-st'y frame store and tenement, tin roof; cost, $3,500; owner, Michael Hanrehan, Fifth Ave., cor. Twentieth St.; architect and builder, Francis Ryan.

Rodney St., s s, 100' w Wythe Ave., two-st'y brick dwell., tin roof, iron cornice; cost, $6,000; owner, Wm. Wendt on premises; architect, E. F. Gaylor; builder, Thomas Gibbons.

La Fayette Ave., n s, cor. Sumner Ave., 9 two-st'y frame dwells., tin roofs; cost each, about $3,500; owner, Chas. I. De Bevoise, 104 De Bevoise Ave.

Reid Ave., s w cor. Lexington Ave., three-st'y brownstone front store and tenement, tin roof; cost, $7,000; owner, architect and builder, Jas. A. Thompson, 300 Lexington Ave.

ALTERATIONS. — *Second St.*, w s, 125' s Broadway, three-st'y brick extension, tin roof; cost, $2,500; owner, Henry Meyers, on premises; builders, J. McQuaid and Jenkins & Gillies.

Chicago.

BUILDING IN 1882. — The building in the past year in this city was never exceeded, except in 1872, the year succeeding the great fire. Even then the amount of building was only twice as great as in the past year, and the amount of ground covered by structures was less than twice as great. Five thousand six hundred and thirty building permits have been issued; the frontage of the new structures, lineal measure, is fourteen miles; the total cost of buildings on permits, $17,500,000; total, probably $20,000,000. The suburban towns show an equal growth and building prosperity. The character of the edifices is generally improved. — *Cincinnati Commercial.*

BUILDING PERMITS. — Willard F. Myrick, 5 two-st'y and basement brick dwells., 21' x 44' each, Twenty-ninth St., cor. Cottage Grove Ave.; cost, $18,000.

John Lauritzen, 2 two-st'y brick dwells., 21' x 50' each, 3633 and 3635 Dearborn St.; cost, $8,000.

Wm. E. Hale, alterations on building, s w cor. State and Washington Sts.; cost, $25,000.

A. S. Lehman, two-st'y and attic brick dwell., 24' x 56', 96 Vernon Park Pl.; cost, $3,000.

Thos. Jones, three-st'y brick dwell., 22' x 44', 324 West Jackson St.; cost, $5,000.

Barbara Titus, 4 three-st'y brick stores and dwells., 60' x 100', 123 to 129 Thirty-fifth St.; cost, $23,000.

Geo. Harding, two stories additional, 30' x 180', 170 Madison St.; cost, $10,000.

Ira Brown, 6 two-st'y brick dwells., 40' x 120', Nos. 144-748 West Jackson St.; cost, $30,000; Cleverdon & Gay, architects.

W. Mathews, Reformed Episcopal Church, one-st'y brick church, 36' x 66'; 823 Larrabee St.; cost, $2,500.

Hans P. Schilling, four-st'y and basement brick store, 20' x 140', 41 South Water St.; cost, $12,000.

Thos. Minchen, three-st'y brick dwell., 20' x 40', 57 East Pearson St.; cost, $7,000.

F. E. H. Hawkins, four-st'y and basement brick dwell., 18' x 40', 49 Peck Court; cost, $10,000.

Norman Bridge, two-st'y and basement brick dwell., 22' x 62', 550 West Jackson St.; cost, $12,000.

John J. Shutterly, two-st'y brick dwell., 24' x 40', 716 Ohio St.; cost, $3,000.

Toolen & Maloney, 2 three-st'y brick stores and dwells., 48' x 60', 3610 and 3612 State St.; cost, $15,000.

Cincinnati.

HOUSES. — Mr. E. Anderson, architect, has prepared plans for a frame dwell., to be built at Hartwell, near Cincinnati, for Mr. John Hornbrook; cost, about $7,000.

Mr. E. Anderson is building a brick house for Mr. Chas. Miller, County Treasurer, at Cumminsville; cost, $6,000.

BUILDING PERMITS. — John H. Empson, 4 two-st'y brick dwells., s w cor. of Hand and Clark Sts.; cost, $5,000.

J. A. Kuhlman, 2 two-st'y brick dwells., Carr St., near Jefferson St.; cost, $6,000.

Two permits for repairs; cost, $2,000.

New York.

CHAPEL. — A picturesque frame chapel, in the Gothic style, is to be erected by the Jesuit Fathers, on Blackwell's Island, from designs of Mr. Jos. M. Dunn.

NEW BUILDING COMPANY. — The certificate of incorporation of "the Bowling-Green Building Company of the City of New York" has been filed in the County Clerk's office. The object of the company, whose capital stock is fixed at $1,000,000, is stated to be to erect buildings in this city. The corporators are William Grenelle, John O. Stevens, and Louis S. Phillips.

SYNAGOGUE. — The Jewish Congregation Shaareh Berochoh has just purchased a lot for a new synagogue.

CONTRACTS. — The Neuchatel Asphalt Co. have contracts for laying with their Val de Travers Rock Asphalt: roofs of No. 8 Pine St.; of No. 444 Canal St.; of apartment-house No. 121 Madison Ave.; of Columbia College Observatory; floor and sidewalk of building of Manhattan Storage & Warehouse Co., Fortieth St., cor. Lexington Ave.; the roof and all the floors of the building of the Lincoln Safe Depesit Co., Madison Ave. and Forty-second St.; and the platforms of stations at New York and Brooklyn ends of the East River Bridge.

OFFICE-BUILDING. — Mr. W. P. Anderson is drawing plans for a large office-building, to be erected for Mr. Twombley, on Beaver St.

RESIDENCE. — For Mr. Adolph Krebs a fine residence is to be built, of brick and stone, on Fifth Ave., 25' s of Eightieth St. It will have a frontage of 25' 6", and be four st'y, with basement; Messrs. D. & J. Jardine are the architects.

BUILDING PERMITS. — *East Sixty-fourth St., Nos.* 321, 323 *and* 325, three-st'y brick storage-building and stable, gravel roof; cost, $5,000; owner, Geo. Mulligan, 33 East Thirty-second St.

Pike Slip, w s, between Cherry and Walter Sts., seven and part eight st'y brick flour-mill; cost, $75,000; owner, Geo. B. Hecker, 278 Madison Ave.; architects, Wm. Field & Son.

Eighty-second St., s s, 375' e Second Ave., five-st'y brick tenement, tin roof; cost, $16,500; owner, Lottie Teebald, 1344 Lexington Ave.; architect, John Brandt.

Canal St., junction of Walker St., seven-st'y brick factory, tin roof; cost, $45,000; owners, Oxley Giddings & Enos, 28 Monroe Place, Brooklyn; architects, Wm. Field & Son.

Broadway, s e cor. Prince St., 2 six-st'y brick stores, concrete and tin roofs; cost, each $150,000; owner, Wm. Astor, 23 West Twenty-sixth St.; architect, Thos. Stent.

Bowery, No. 264, three-st'y brick store and dwell., tin roof; cost, $20,000; owner, John Jacob Astor, 21 West Twenty-sixth St.; architect, Thos. Stent; builders; Jas. Webb & Son and J. Downey.

One Hundred and Eleventh St., n s, 195' 11" w of St. Nicholas Ave., 6 three-st'y brick dwells., tin roofs; cost, each $8,500; owner, Edward J. King, 347 Fifth Ave.; architects, D. & J. Jardine; builders, John P. Schweikert and Grisner & Fausel.

Broome St., No. 328, four-st'y brick tenement and store, tin roof; cost, $12,000; owner, Mary L. Patten, 113 East Fifty-seventh St.; architect, Wm. Graul.

Fifty-third St., s s, 103' w of Lexington Ave., 4 five-st'y brick tenements, tin roofs; cost, each $15,000; owner, John Davidson, 116 East Fifty-sixth St.; architect, A. B. Ogden.

Pike St., No. 76, five-st'y brick tenement, tin roof; cost, $12,000; owners, Theodore H. Calam et. al.; architect, Jas. S. Wrightman.

Pike St., Nos. 78 *and* 80, 2 five st'y brick tenements, tin roofs; cost, each $16,000; owners and architect, same as last.

Pike St., No. 82, n w cor. Cherry St., five-st'y brick tenement, tin roof; cost, $21,000; owners and architect, same as last.

ALTERATIONS. — *Murray St., No.* 77, repair damage by fire; cost, $3,700; owners, Thos. Adams & Sons, 297 Waverly Pl.; builder, Henry Wallace.

Broadway, s w cor. Forty first St., to Seventh Ave., internal alterations; cost, $15,000; owners, the Metropolitan Concert Co.; lessee, Sylvester M. Hickey; architect, H. J. Dudley.

Grand St., No. 253, repair damage by fire; cost, $2,500; owner, estate of R. Cochran, A. W. Hardman, agent, 446 Broome St; builder, John Leslie.

Rivington St., No. 43, roof raised, also a one and three st'y brick extension; cost, $2,000; owner, Chas. Forschner, 39 Rivington St.; architect, Fred Jenth.

East Fourteenth St., Nos. 116 *and* 118, repair damage by fire; cost, $6,420; owner, Wm. C. Schermerhorn, 68 Wall St.; architect, D. Linau; builders, Ben Blackledge and L. N. Williams.

Philadelphia.

BUILDING PERMITS. — *Alder St.*, w s, n of Norris St., 2 two-st'y dwells., 14' x 28'; Michael Smith, owner.

Terrace St., n w cor. Adams St., one-st'y Mission building, 38' x 59'; S. Yardley, owner.

Tenth St., No. 968, addition to brick building, 15' x 31'; N. S. Bowers, owner.

Terrace St., e s, n of Shur's Lane, 2 two-st'y dwells.; 14' x 46'; David Harper, owner.

Cumberland St., n w cor. Mill St., two-st'y addi-

tion to factory, 30′ x 32′; D. S. McKnabb, contractor.

Main St., e of Shur's Lane, rebuilding factory, 52′ x 150′; S. S. Keely, contractor.

South Twenty-eighth St., Nos. 1113 *and* 1115, 2 two-st'y dwells., 14′ x 21′, Geo. Mowbray, owner.

Sophia St., w s, s of Edward St., 2 rebuilding foundries, 17′ x 80′ and 20′ x 100′; T. Shoemaker, contractor.

Broad St., s w cor. Catharine St., two-st'y stable, 17′ x 32′; Chas. O'Neill, contractor.

Eardman St., n of Perkiomen St., two-st'y dwell., and one-st'y stable, 16′ x 26′ and 14′ x 65′; James McCartney, contractor.

Thirteenth St., e s, s of Cherry St., third, fourth and fifth st'y addition to brick building, 21′ x 40′; Jno. Mundell, owner.

Spruce St., No. 3909, two-st'y addition to brick building, and interior alterations, 16′ x 20′; E. L. Hall, owner, Woodbury, N. J.

Additions. — Addition and alteration to residence of W. S. Blight, Pine St., above Broad St.; Hazlehurst & Huckel, architects.

Addition and alteration to residence of Mrs. H. J. Biddle, Walnut St., w of Sixteenth St.; Hazlehurst & Huckel, architects.

St. Louis.

Building in 1882. — Investigation shows that during the year 1882 prosperity in business circles in St. Louis has been the rule. There has been a slight decline in business during the past three months, but on the whole the volume of trade has greatly increased over that of last year. The year has been remarkable on account of the number, variety and costliness of the new buildings which have been erected. The total estimated value of all the improvements of this character which were projected is $5,385,012.50, or nearly $1,000,000 in excess of last year. During the year there have been issued 2,631 building permits, of which only 715 were for frame structures. The five most important buildings completed during the year were the new Belcher Sugar Refinery, the Olympic Theatre, the new College of the Christian Brothers, the Gay Building, and the Leighton Building, which together cost upward of $1,000,000. The Belcher Sugar Refinery is thirteen stories above the basement, and nearly 8,000,000 millions of bricks were used in its construction. — *N. Y. Commercial Advertiser.*

Building Permits. — Six permits have been issued since our last report, of which two are for unimportant frame houses. Of the rest those worth $2,500 and over are as follows: —

Trustees of U. M. E. Church, two-st'y brick church; cost, $7,000; A. Beinke, architect; sub-let.

A. J. Cramer, two-st'y brick dwell.; cost, $2,500; A. J. Cramer, architect and builder.

Syracuse, N. Y.

Houses. — A stone house for Mr. H. G. White is in process of erection. Foundations and enclosing, $32,000; architect, H. Miller, of Ithaca.

Mr. L. D. Dennison is building a frame house on James St.; A. Russell, architect.

A. F. Lewis is building a two-st'y and attic frame house; architect, J. L. Silsbee; builder, C. Wiehorn, Jr.

Rev. C. N. Sims, Chancellor of Syracuse University, is building a two-st'y frame house; cost about $1,500; builder, C. Wiehorn, Jr.; architect, E. M. Buell.

Dr. G. D. Whedon is building new offices; cost about $1,000; builders, G. Schattle & John Schaffer; architect, E. M. Buell.

Factory. — Mr. Christian Cook is building a factory on W. Onondaga St., brick and stone; cost, about $10,000; C. & L. Merrick, builders; A. L. Merrick, architect.

Government Building. — The Commission appointed to select a site for the new Post-Office and Government Office Building, to be erected here, have reported in favor of St. Paul P. E. Church property, situated near the centre of the city and well fitted for the purpose. The lot is 100′ x 132′; $70,000 is asked for the property.

Warehouse. — Sperry, Neal & Hyde will build a five-st'y brick and stone block for a wholesale dry goods house; Mr. A. L. Merrick is the architect.

The numerous buildings just completed and now in course of erection show that this enterprising little city is growing fast. The prospects for the spring are full of promise for builders and architects.

Bids and Contracts.

Buffalo, N. Y. — The contract for iron stairs for the Fitch Institute (as per advertisement in *American Architect*) was let on the 29th to Poulson & Eger for $4,100; plumbing to J. D. Smith, of Buffalo, for $2,000; J. G. Cutler, of Rochester, architect.

Yorktown, Va. — The following bids for the erection of the Yorktown Monument have been received: —

No. 1, Daniel C. Hutchinson, No. 137 Chambers St., New York, and Washington, Mass., $74,000.

No. 2, Mount Waldo Granite Company Works, John T. Roe, Frankfort, Me., $74,700.

No. 3. Weston Granite Company, Virginia, R. Snowdon Andrews, President, $74,987.87.

No. 4. Bodwell Granite Co., Rockland, Me., R. H. Lowrey, President, $60,436.

No. 5. Hallowell Granite Co., Hallowell, Me., $58,500.

No. 6. Davis Tilson, Rockland, Me., $60,000.

No. 7. Brown, McAllister & Co., New York, $115,000.

No. 8. Hallowell Granite Co., J. R. Bodwell, President, Hallowell, Me., $59,487 if built of Hallowell granite; $59,939 if built of Westerly granite, and $5 extra for each letter of the inscriptions if they are to be raised.

No. 9. E. C. Sargent, of the Concord Granite Co., Concord, N. H., $99,000. The latter bid was not on the regular blanks prepared for the purpose, and was declared informal.

The bid will be presented to the Secretary of War, and on his judgment the award will be made.

General Notes.

Altoona, Pa. — A $65,000 opera-house is to be built for Mr. J. Schenck. Work will be commenced soon and it is to be completed by the fall.

Baltimore Co., Md. — Suburban residence, for Mr. J. D. Mallory, frame, 50′ x 80′, with stable and carriage-house that cost $4,500; total cost, $32,000; John C. Cross, of Waverly, Baltimore Co., builder; Geo. A. Frederick, Baltimore, architect.

Caledonia, N. Y. — Plans are being prepared for a stone church, by Oscar Knebel, architect.

Carlisle, Pa. — Presbyterian Chapel, 40′ x 75′; to be built of local stone; Hazlehurst & Huckel, architects, Philadelphia, Pa. A public reading-room is included in above building.

Conshohocken, Pa. — Plans for the Tradesman's National Bank have been prepared by Hazlehurst & Huckel, architects, Philadelphia, Pa.

Denver, Col. — Mr. W. J. Fay is to build two brick houses on Kansas Ave.; cost, $5,000.

Detroit, Mich. — The returns of the Fire Marshal for 1882 show that the value of the new buildings authorized during the year amounts to $3,077,064; repairs, $383,017. This is an increase of $1,000,000 over 1881.

Fall River, Mass. — The mayor's late address recommends the issue of bonds for the erection of a high-school building, and then the creation of a sinking-fund of $5,000 or $10,000 a year to pay for it. Extensive repairs are also needed by the city-hall.

Gloucester, N. J. — It is announced that Whitney Brothers, glass manufacturers at Glassboro, have purchased 150 acres of land on Big Lumber Creek, near Gloucester, and contemplate moving their works to that place in the event of Congress taking favorable action on the tariff.

Govanstown, Md. — Mrs. M. C. Brown is building an addition to her residence, to cost $1,400; G. Blake, builder; J. A. & W. T. Wilson, architects.

Harrisburg, Pa. — The Philadelphia Asphalt Block Company was chartered at the State Department, January 6. The capital is $100,000, and William B. Mann is President.

Joliet, Ill. — The cost of the new elevator-building of the Joliet Elevator Co. will be $225,000.

Keene, N. H. — The Pargetized Can Company of Charlestown propose to build a factory at Keene.

Knoxville, Tenn. — The East Tennessee Valley Zinc Company, organized a short time ago with a capital of $300,000, has just let contracts for the erection of the furnaces and buildings in this city.

Le Mars, Io. — Warren & Sammis are to build an opera-house; cost, $30,000.

Middleboro, Mass. — There is talk of erecting a paper and pulp mill on the Muttock privilege, so-called.

Minneapolis, Minn. — Col. Wood contemplates the enlargement of his opera-house in the spring, by building it out to the street front and adding another story, which will give it a seating capacity of 2,100.

Milwaukee, Wis. — The Chicago, Milwaukee and St. Paul R. R. Co. is to build at the corner of Second and Fowler Sts., a freight-house; cost, $50,000.

Mount Clemens, Mich. — N. J. Gibbs is preparing plans for a frame residence, to cost about $3,000, to be built by Geo. W. Fletcher.

Newark, N. J. — A new opera-house is to be built on the property running through from Bank to Academy St., near Broad St.

Orange, N. J. — For Mr. J. C. Ogden, Jr., a residence, to cost about $15,000, is to be built from designs of Mr. H. R. Marshall, of New York.

Providence, R. I. — There was about $1,099,316 laid out on new buildings at Providence in 1882. Pawtucket expended over $500,000, of which $340,000 was for business purposes.

Over $190,000 of the Catholic cathedral fund has been spent since the work was taken under contract. The work to be done in 1883 calls for $56,295.

Ravenswood, Ill. — All Saints' Episcopal Society is to build a brick and stone church, at a cost of $7,000.

Reading, Pa. — The city is to build a brick fire-engine-house, cost, $7,000, from plans by W. A. Frink.

Spring Lake, N. J. — R. N. Carson, of Philadelphia, will build a cottage, to be frame and tile; to cost about $7,000; also carriage-house and stable to cost about $1,200; Hazlehurst & Huckel, architects, Philadelphia, Pa.

St. Paul, Minn. — A $15,000 house is to be built for Mr. C. P. Noyes; designs are now being prepared by Mr. H. R. Marshall, of New York.

Toledo, O. — The Union Elevator Co. is to spend $225,000 on a new elevator-building.

Washington, D. C. — Supervising Architect J. G. Hill has completed the plans for the proposed fire-proof Record Building, to be erected in this city, which will be submitted to Congress by Secretary Folger. If the present plans are adopted, the building will have a length almost equal to that of the Capitol. It will be five stories on each end, with a six-st'y centre, surmounted by a high cupola.

Westfield, Mass. — Contractors are now making estimates for a three-st'y brick building, 85′ x 125′, for the Palmer Wire Company, which will be erected at an early day.

PROPOSALS.

LOCK. [On the Great Kanawha River, W. Va.]

U. S. Engineer Office,
Charleston, Kanawha Co., W. Va.,
December, 10, 1882.

Proposals for building lock No. 2, of the Great Kanawha River, will be received **until noon of January 31, 1883,** and opened immediately thereafter.

Blank forms and specifications can be had upon application at this office. E. H. RUFFNER,
370 Captain of Engineers.

COURT-HOUSE. [At Charlotte, Mich.]

In consequence of the destruction of the plans for Eaton County Court-House, by the burning of the architect's office in Hall Block, Toledo, O., the date of the letting of the contracts is postponed to January 24, 1883. D. W. GIBBS & CO.,
Architects.

PROPOSALS.

PILES AND STONE. [At St. Louis, Mo.]

U. S. Engineer Office, 404 Market St.,
St. Louis, Mo., December 15, 1882.

Sealed proposals, in duplicate, will be received at this office **until 12 o'clock, M., on January 15, 1883,** for furnishing and delivering 10,000 cottonwood piles and 25,000 cubic yards rip-rap, for improvement of the Mississippi River below St. Louis.

For blank forms for proposals and all necessary information apply to O. H. ERNST,
368 Major of Engineers.

DIKE. [At New Haven Harbor, Conn.]

U. S. Engineer Office,
New London, Conn., Dec. 23, 1882.

Sealed proposals, in triplicate, will be received at this office **until 11 o'clock A. M. on the 23d day of January, 1883,** for constructing a dike in New Haven Harbor, Conn., to be built partly of rip-rap stone, partly of piles and stone.

Specifications and blank forms for proposals and for guaranty will be sent on application to this office. J. W. BARLOW,
370 Major of Engineers.

WATER-MAINS, ETC. [At Wakefield, Mass.]

Wakefield, Mass., January 10, 1883.

Sealed proposals for furnishing water-pipes, water-gates and fire-hydrants, and for laying and setting the same will be received by the Quannapowitt Water Company, of Wakefield, Mass., **until noon of Wednesday, January 24, 1883.**

Specifications and blanks will be furnished to bidders only on application to the engineer.

The right to reject any or all proposals is reserved. CYRUS WAKEFIELD, President,
369 PERCY M. BLAKE, Engineer.

HOT-WATER HEATING-APPARATUS. [At Charleston, W. Va.]

Office of Supervising Architect,
Treasury Department,
Washington, D. C., December 30, 1882.

Sealed proposals will be received at this office **until 12 M., on the 23d day of January, 1883,** for furnishing and fixing in place complete, in the court-house and post-office building at Charleston, W. Va., a low-temperature hot-water heating-apparatus, in accordance with drawings and specification, copies of which and any additional information may be had on application at this office or the office of the Superintendent. JAS. G. HILL,
368 Supervising Architect.

FIRE-ENGINE HOUSE. [At Providence, R. I.]

Office of the Supt. of Public Buildings,
City Hall, Providence, Dec. 28, 1882.

Sealed proposals, addressed to the undersigned, for the construction of abuilding, to be erected upon the lot owned by the city, fronting on North Main and Mill Streets, to be used as a fire station and ward room, will be received at the office of the Superintendent of Public Buildings, City Hall, **until 12 M., Friday, January 19th, 1883.**

Plans and specifications may be seen and information obtained at the office of Wm. R. Walker & Son, architects, No 27 Custom House Street.

The right will be reserved to reject any or all bids for the work. JAMES McNALLY,
369 Chairman Committee on City Property.

SCHOOL-HOUSE. [At Home City, O.]

Sealed proposals will be received by the Board of Education of the Delhi Station School District No. 6, **until Monday, February 5, 12 o'clock, M.,** for the materials and labor required for building an eight-room school-house in Home City, Hamilton County, O., according to plans and specifications on file at the office of S. Hannaford, architect, Room 18, Palace Hotel Building, Cincinnati, and at the office of Dr. John Campbell, Home City.

Bids must be on blank forms, to be obtained at either office.

Each bid must contain the name of every person interested therein, accompanied by a sufficient guaranty by some disinterested person in a penalty equal to the amount of the bid, that if the bid is accepted the contract will be entered into, and the performance of it properly secured.

All bids must be addressed to R. H. Gibson, Clerk of the Board, at Delhi, O., or 174 Elm St., Cincinnati, O.

The right is reserved to reject any or all bids.

By order of the Board of Education.
370 R. H. GIBSON, Clerk.

TOWN-HALL. [At Madisonville, O.]

Sealed proposals will be received by the clerk of the village of Madisonville, Hamilton County, O., **until 12 o'clock at noon of January 20, 1883,** for the furnishing of materials and doing the necessary work in the erection of a town-hall in the said village of Madisonville, according to plans and specifications furnished by Samuel Hannaford, architect, and which for the convenience of bidders will be on file until January 6, 1883, at the Council Chamber in Madisonville, and after that until noon of January 20, 1883, at the office of Samuel Hannaford, architect, Room 18, fourth floor, Palace Hotel Building, Cincinnati.

Bids must be made for the work separately, to wit: Mason's work, including excavations and grading; carpenter's work; plumbing and gas-fitting; painting and glazing; roofing, including galvanized-iron and tin work; iron-work and cut-stone work.

The bids may be for either work or material, or for both; if for both, each must be separately stated, with the price.

The county reserves the right of rejecting any or all of the bids.

Each bid to be accompanied by two sureties. Bidders to use the printed forms in the hands of clerk, as no other will be received. 368

By order of Council. J. ED. JULIEN, Clerk.